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DNP FINAL REPORT: ENHANCING NURSES' KNOWLEDGE ON OPIOIDS TO PROMOTE SAFE OPIOID USE IN POST-OPERATIVE PATIENTS: AN EVIDENCE-BASED PRACTICE PROJECT

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by

AMARDEEP GILL

A DNP Final Report submitted in partial fulfillment
of the requirements for the degree of
Doctor of Nursing Practice
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Dedication

I dedicate this paper to the memory of my brother ‘Vicky’ who always believed in my abilities to earn a doctorate degree and encouraged me to pursue my dream. He taught me to believe in myself, don’t quit, and to keep pursuing my passions no matter what.

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Abstract

DNP FINAL REPORT: ENHANCING NURSES' KNOWLEDGE ON OPIOIDS TO PROMOTE SAFE OPIOID USE IN POST-OPERATIVE PATIENTS: AN EVIDENCE-BASED PRACTICE PROJECT

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Pain control remains suboptimal in the United States, while the use and misuse of opioids are growing. Opioid use disorder and opioid misuse are associated with an increased risk of postoperative mortality and morbidity. The Centers for Disease Control and Prevention reported more than 232,000 deaths from a prescription opioid overdose from 1999 to 2018. The economic burden related to prescription opioid misuse in the United States is $78.5 billion a year. According to the literature, lack of knowledge makes patients vulnerable to misuse and nonmedical use of opioids. This lack of patients' knowledge and over-prescription of opioids are among many of the risk factors for opioid misuse. Literature shows a need for education among registered nurses related to the risk factors, differences in opioid-tolerant and opioid-naïve patients, and early recognition/management of opioid overdose. There is strong evidence that an

increase in nurses' knowledge of opioids subsequently increases patient's knowledge of opioids (Costello, 2016). The nurses are the frontline workers and can assist patients and families by providing an appropriate education on the safe use of opioids. Therefore, the nurses need to be competent in current evidence-based strategies to increase the patients' knowledge of opioids and prevent opioid misuse.

The purpose of the project is to educate the nurses on opioids, including the terminology, risk factors associated with opioid use disorder, various pharmacological and non-pharmacological treatment options, and strategies to prevent opioid misuse among postoperative patients. And, to answer the PICOT question, in post-operative patients in a day surgery unit (P), how does preoperative education about opioids (I) compare to traditional preoperative education or no education (C) affect patient knowledge of opioids and postoperative opioid use (O) within three months (T)?

Chapter 1 Development of the Clinical Question and Problem Identification

Pain control remains suboptimal in the United States, while the misuse and abuse of opioids are growing (Brady, McCauley, & Back, 2016). Opioid misuse was declared a national epidemic in 2017. In Texas, the number of opioid-related overdose deaths in 2016 was 1,375. In 2016, 91.8 million adults used prescription opioids, and 11.5 million misused them. The total cost of prescription opioid misuse is $78.5 billion a year, including healthcare costs, lost productivity, addiction treatment, and criminal justice involvement (National Institute on Drug Abuse, 2018). The purpose of this project is to increase patient and nurses' knowledge of opioids, promote the responsible use of opioids, prevent misuse, and decrease long-term opioid use.

Background and Significance

Opioid misuse is a broad term that captures any use outside of the prescription guidelines by the prescriber. Opioid misuse is related to misunderstanding of instructions, self-medication, and compulsive use driven by an opioid use disorder. Opioid misuse can also happen when the person wants to “get high,” which is an example of prescription drug abuse (Brady et al., 2016). According to Krashin et al., once patients take opioids longer than 90 days, the risk of continuing to take them chronically and developing a substance use disorder increases. The factors contributing to the chronic opioid use and development of opioid use disorder were prior opioid use, daily opioid doses of 120 mg morphine equivalent dose (MED) per day, and possible misuse (Krashin et al., 2016).

“Addiction is a brain disease that touches families across America – even my own,” said U.S. Surgeon General Jerome M. Adams (2018). “We need to work together to put an end to stigma” (U.S. Department of Health & Human Services (DHHS), 2018). Addiction is continued use despite harm. He further indicated that all Americans could participate in raising awareness of opioid misuse and reduce overdose deaths.

A recent report from the Center for Disease Control (CDC, 2017) shows that opioids were associated with 42,249 deaths in 2016, five times higher than in 1999. Opioid overdose increased 30 % from 2016 through 2017. There is a 10.6 percent increase in the prescription opioid-related overdose death rate from 2015 to 2016. About 21 to 29 % of patients misuse prescribed opioids for chronic pain. Among those, about 8-12 % develop an abuse disorder (National Institute on Drug Abuse, 2018).

This data constitute an urgent call to action to stop the opioid misuse epidemic in the United States. On October 26, 2017, the White House administration declared the opioid crisis a national public health emergency under federal law (The White House, 2017). National Institutes of Health (NIH) Director Francis S. Collins announced HEAL (Helping to End Addiction Long-term) Initiative: an aggressive, trans-agency effort to speed scientific solutions to stem the national opioid public health crisis. Toward this effort, NIH nearly doubled funding for research on opioid misuse/addiction and pain from approximately $600 million in the fiscal year 2016 to $1.1 billion in the fiscal year 2018, made possible from a funding boost by Congress.

According to Brummet et al. (2017), millions of patients in the United States get surgical interventions each year. Opioids are beneficial and commonly used for acute postoperative pain, even though the data do not support the continual effectiveness of

opioids for prolonged time postoperatively. Patients need pain relief and promotion of comfort after surgery, but opioid use for acute pain can increase the risk of chronic opioid use, which, in turn, can increase deaths from overdose (Brummet et al., 2017). Opioids are prescription medications for the treatment of acute or chronic pain. However, patients used opioids prescribed for postsurgical pain for other symptoms like musculoskeletal pain and insomnia, often not knowing that opioids are not useful for these issues. New persistent opioid use after surgery is an increasingly common and under-recognized complication of perioperative care. In a cohort of privately insured patients in the United States, persistent opioid use (continued prescription fills between 90 and 180 days after discharge) after surgical procedures was 5.9% to 6.5%, and 6% of those who underwent elective minor or major surgical procedures continued to use opioids for at least 90 days after surgery (Brummet et al., 2017).

At Baylor Scott & White Medical Center at Plano, Texas, there are approximately 30 surgeries performed daily, and the patients receive opioid pain medication prescriptions upon discharge. At discharge, the patients get standard discharge care on pain management, incision care, and follow-up instructions. There is no specific opioid education provided preoperatively, postoperatively, and at the time of discharge. The nurses provide brief information on the pain medication before administration.

The patient survey rating measures patients' experiences of their hospital care about various topics. In Figure 1, Hospital Safety Guide, the patients were asked about how well nurses communicated about the medications. According to hospital safety guide (2019), the facility scored average on the performance scale for communication on the medications.

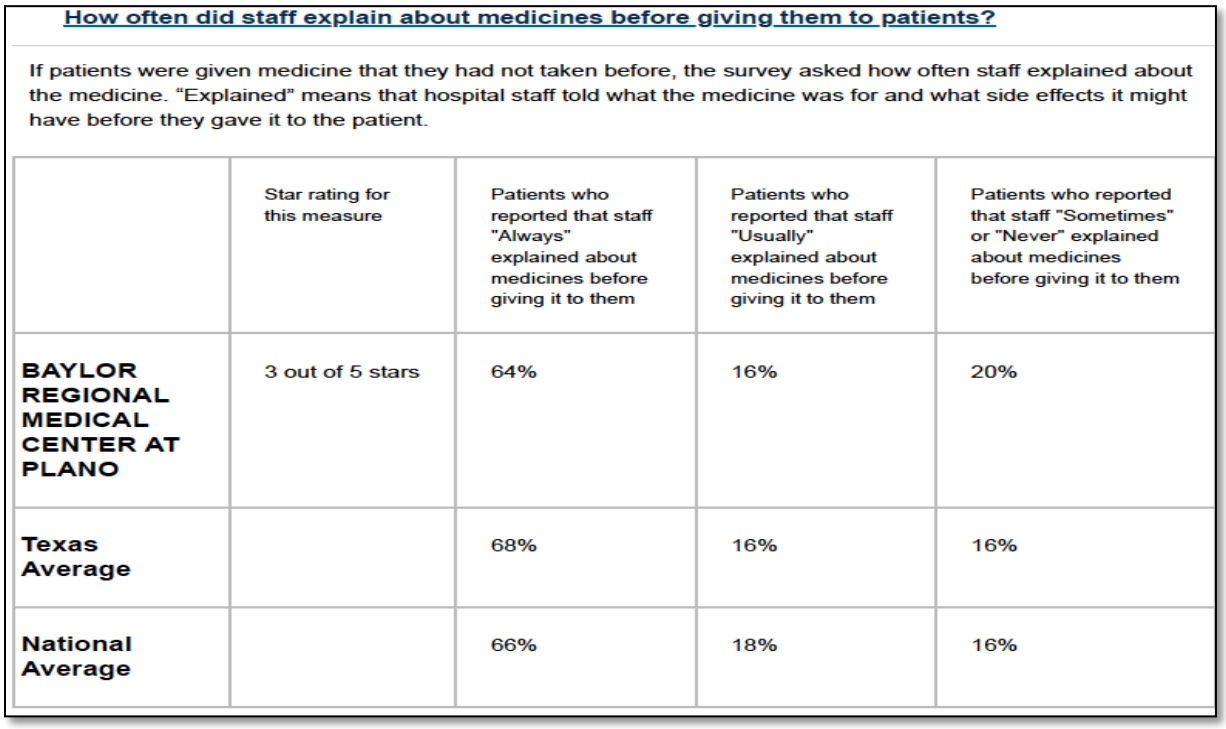
Figure 1

Hospital Safety Grade

As shown in Figure 2, Facility Scores In Medication Explanation Against State & National Scores, the percentage of patients who reported that the staff "Always" explained about medicines before giving it to them was 64% which is below the state and national average.

Figure 2

Facility, State, & National Scores in Medication Explanation



How often did staff explain about medicines before giving them to patients?

If patients were given medicine that they had not taken before, the survey asked how often staff explained about the medicine. "Explained" means that hospital staff told what the medicine was for and what side effects it might have before they gave it to the patient.

	Star rating for this measure	Patients who reported that staff "Always" explained about medicines before giving it to them	Patients who reported that staff "Usually" explained about medicines before giving it to them	Patients who reported that staff "Sometimes" or "Never" explained about medicines before giving it to them
BAYLOR REGIONAL MEDICAL CENTER AT PLANO	3 out of 5 stars	64%	16%	20%
Texas Average		68%	16%	16%
National Average		66%	18%	16%

According to the county health rankings and roadmaps (2016), there are 196/100,00 drug overdose-related deaths in Collin County in 2012-2014 (County Health Rankings, 2016). According to the Texas Department of State Health Services (TDSHS), Collin County witnessed a 20 percent increase in opioid related overdose deaths in 2015 (TDSHS, 2017).

Studies showed a strong relationship between the number and duration of refills of prescribed opioid drugs and subsequent opioid misuse in the surgical population. The researchers focused on typical surgical patients without a history of misuse or ongoing opioid use and estimated an adjusted 44% increase in misuse for every refill. Each week of opioid use was associated with a 20% increase in misuse (Brat et al., 2017). Surgeons overprescribe opioids postoperatively, and there are wide variations in

prescriber practices. The average duration of opioid prescriptions has not increased over time. However, the mean morphine equivalents (MME) prescribed to opioid naıve patients increased from 2008 to 2012 (Lanzillotta et al., 2018). The MME and opioid naïve patients are defined as -

- Mean Morphine Equivalents (MME) determines a patient's cumulative intake of any drugs in the opioid class over 24 hours.
- Opioid-naive patients are those who have not received opioids in the 30-days before the acute event or surgery.

Postoperative prescription opioids often go unused, unlocked, and undisposed, suggesting an essential reservoir of opioids contributing to nonmedical use of these products, which could cause injuries, misuse, or even deaths. In a 2016 study, Costello, Thompson, Aurelien, and Luc concluded that many patients do not know the proper use of opioids at the time of discharge. This lack of knowledge makes patients vulnerable to misuse and nonmedical use of opioids (Costello et al., 2016). In a descriptive study, Bicket et al. concluded that 67% to 92% of patients reported unused opioids, and 73% to 77% reported improper storage of prescribed opioids (2017).

Education has been a fundamental component and valuable tool to empower patients throughout the centuries. Patient education helps patients better understand their condition, medical/surgical procedures, and treatment choices. Registered nurses are on the front lines of addressing the epidemic by educating patients to understand the risks and benefits of pain treatment options, including opioids, and recognizing those at risk for substance use disorder (American Nurse Association, 2018). In a review, Oshodi (2007) reported that pain and anxiety increase as patients feel a lack of

control over their situation. Through preoperative education, specifically on pain management, patients feel less anxious about postoperative pain and gain control over their situation. Patients who understand more about pain management were better prepared to cope with postoperative pain, ask questions, and knew better when to notify the doctor for complications (Oshodi, 2007).

Patient education helps patients better understand their condition, medical/surgical procedures, and treatment choices. According to a survey, Kaiser stated that the nurses had a strong knowledge of pharmacology and the use of non-opioids medications for pain management (Kaiser, 2020). In a quasi-experimental study, Costello, Thompson, Aurelien, and Luc (2016) recommended that future studies should "evaluate not only patients' understanding of the safe use of opioids at home but also specific patient outcomes after receiving education about opioid misuse and overdose" (Costello et al., 2016).

Therefore, the question arises, in postoperative patients in a day surgery unit (P), how does preoperative education about opioids (I) compare to traditional preoperative education or no education (C) affect patient knowledge of opioids and postoperative opioid use (O) within three months (T)?

Chapter 2 Evidence Synthesis and Models

Searching for Evidence

A rigorous systematic search of the literature was performed to provide the most reliable evidence with confidence. The three electronic databases searched were: the Cumulative Index of Nursing and Allied Health Literature (CINAHL), the Cochrane Database of Systematic Reviews, and the PubMed. The systematic search strategy was performed using the same search terms across all the three databases (Melnyk & Fineout-Overholt, 2019). Keyword and controlled vocabulary searches included the terms:

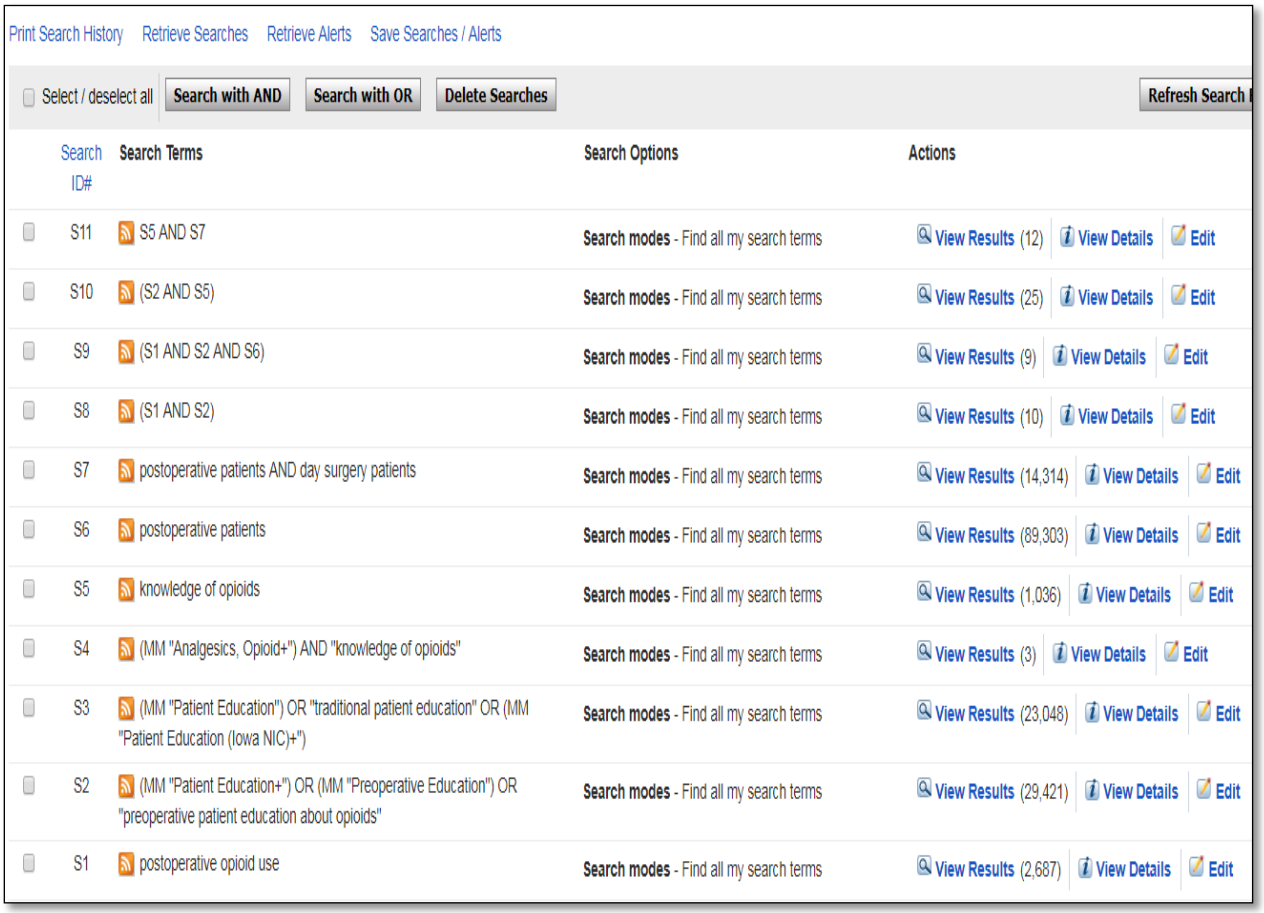
- Opioid
- Opioid use
- Postoperative opioid use
- Knowledge
- Knowledge of opioids
- Postoperative patients
- Day surgery patients
- Patient education
- Traditional education
- Preoperative patient education

The inclusion criteria used to control results was to include the studies: (1) published in English, (2) preoperative day surgery patients, and (3) examine the effect

of preoperative patient opioid education related to no preoperative or traditional preoperative education. The author excluded all the studies involving pediatrics, the participants under eighteen, and the pregnant women. As shown in Figure 3, the CINAHL search yielded 25 articles, and after the application of inclusion criteria, 12 articles were screened for relevancy.

Figure 3

Screenshots of CINAHL Systematic Search of the Relevant Terms



After reviewing the rest of the articles, six was relevant to the PICOT. A hand search was performed to look for any additional articles that might have been missed with the keyword search. Two other articles met the selection criteria after reviewing for

relevancy for a total of 14.

As shown in Figure 4, PubMed was also searched. The automatic term mapping was utilized. According to this search strategy, the typed keywords mapped to any appropriate MeSH (Medical Subject Headings) terms (Melnyk & Fineout-Overholt, 2019). The search terms were combined with 'AND' & 'OR' connectors. The PubMed result yielded ten studies, and after reviewing for relevancy to PICOT, four studies made it to the critical appraisal.

Figure 4

Screenshots of the PubMed Systemic Search of the Relevant Terms

History

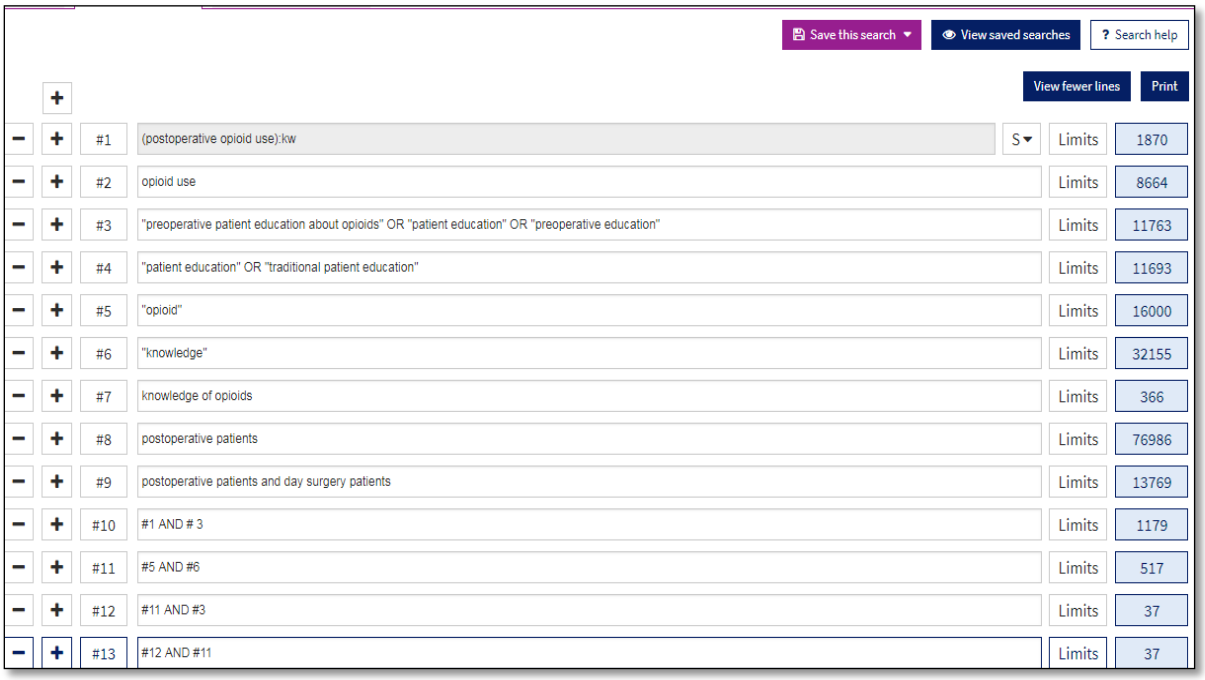
Download history Clear history

Search	Add to builder	Query	Items found	Time
#14	Add	Search (((postoperative opioid use) AND ((("preoperative patient education about opioids") OR "patient education") OR "preoperative education")) AND knowledge of opioids) AND postoperative patients	10	13:05:33
#13	Add	Search (((((("preoperative patient education about opioids") OR "patient education") OR "preoperative education")) AND knowledge of opioids) AND postoperative patients	10	13:04:59
#12	Add	Search (knowledge of opioids) AND ((("preoperative patient education about opioids") OR "patient education") OR "preoperative education")	111	13:04:34
#11	Add	Search ((postoperative opioid use) AND (("patient education") OR "traditional patient education")) AND postoperative patients	73	13:03:46
#10	Add	Search ((postoperative opioid use) AND ((("preoperative patient education about opioids") OR "patient education") OR "preoperative education")) AND postoperative patients	75	13:03:03
#9	Add	Search (postoperative opioid use) AND ((("preoperative patient education about opioids") OR "patient education") OR "preoperative education")	101	13:02:30
#8	Add	Search (postoperative patients and day surgery patients)	46577	13:01:35
#7	Add	Search postoperative patients	457036	13:01:04
#6	Add	Search knowledge of opioids	2761	13:00:00
#5	Add	Search ("Analgesics, opioid") AND "knowledge of opioids"	1880	12:59:40
#4	Add	Search ("patient education") OR "traditional patient education"	94943	12:58:41
#3	Add	Search (("preoperative patient education about opioids") OR "patient education") OR "preoperative education"	95068	12:57:39
#2	Add	Search postoperative opioid use	17884	12:56:07

As shown in Figure 5, the last database searched was the Cochrane Database of Systematic Reviews. The MeSH descriptor and the explode feature for each term were used to search within this database. The terms were combined with the Boolean operator 'AND.' A total of 37 articles yielded from this search in the search manager. After reviewing the abstracts, three articles were relevant to the PICOT. The other systematic reviews were not related to the proposed clinical question because they focused on medical and pharmacological interventions rather than education. A total of fourteen articles consisting of randomized controlled trials (RCT's), quasi-experimental, case-control, and cohort, descriptive, and a case study were chosen for further review.

Figure 5

Screenshots of the Cochrane Systemic Search of the Relevant Terms



Critical Appraisal

Once a body of evidence (BOE) was obtained after a rigorous systematic search, the next step performed rapid critical appraisal using the General Assessment Overview

(GAO) and Rapid Critical Appraisal checklist (RCAC) of the studies. The purpose of the GAO is to assist the clinicians in documenting specifics about the studies, such as the study's purpose, independent variables, and dependent variables. Applicable RCA appraisal principles for each study were performed to determine if the literature identified from the systematic search was relevant, valid, feasible, and applicable to the PICOT question (Melnyk & Fineout-Overholt, 2019).

During RCA, the following were evaluated: the level of evidence, whether the studies and reviews were all conducted, and the degree to which each answered the clinical question (Melnyk & Fineout-Overholt, 2019). Through RCA, the keeper studies included were six RCTs, two controlled trials without randomization, two case-control/cohort studies, and four descriptive or qualitative studies. One of the quality improvement projects did not meet the outcome criteria concerning PICOT and did not make to the evaluation phase.

Evaluation & Synthesis

The next step in the evidence-based practice process was organizing and evaluating the data presented from the fourteen keeper studies in a table form called ‘Evaluation Table’ as shown in Appendix A: Critical Appraisal of Evidence. The evaluation table aims to organize the information in one table from all fourteen studies to establish patterns across the studies. After completing the evaluation table, synthesis tables were developed to display similarities and differences among the findings (Fineout-Overholt & Melnyk, 2019). All the fourteen studies were synthesized into tables. While reviewing the settings across all the studies, the context of 13 studies was preoperative setting and one study was conducted in the emergency room. Out of

fourteen studies, nine concluded the positive effect of preoperative education on the knowledge, six reported decreased opioid use, and two reported decreased pain intensity. The remaining three studies found that preoperative opioid education decreased confusion, pain-related interference with activities and reduced the number of opioids prescribed by the surgeons. The opioid-related information was presented in verbal and written form in the thirteen studies.

The intervention in the form of a video was in three studies, and only one review has just the written form only. Two studies showed an increase in nurses' knowledge of opioids subsequently increases patient's knowledge of opioids. In Appendix B, the synthesis Table B1, the level of evidence was presented. Forms of interventions, study descriptions & results, the outcomes, and the studies with significant findings addressing the PICOT were synthesized. Level II evidence is from randomized controlled trials, and out of six RCT's four showed a statistically significant ($p<.05$) increase in knowledge, and three concluded a statistically significant decrease in opioid use in the intervention group. Seven studies in LOE from III-VI reported an increase in knowledge, and three showed a reduction in opioid use. The interventions were compared across the studies to identify an effective intervention to increase patient's knowledge and decrease opioid use, as shown in Appendix B, Table B2.

The form of education in various studies was written, verbal & written, written & video. The written information was delivered either by a patient education card or opioid education pamphlet. The study by Hartford et al. (2018) included verbal, written information and pain management guidelines, as shown in Appendix B, Table B3. The surgeon delivered the education called 'preoperative opioid counseling.' The

questionnaire, pretest & posttest measured the knowledge across all fourteen studies. The actual number of pills, Milligram Morphine Equivalent (MME) and Opioid in Morphine Equivalent (OME), measured the actual opioid use postoperatively. The Numeric Rating Scale (NRS), Visual Analogue Scale (VAS), and Verbal Rating Scale (VRS) measured pain intensity.

Recommendation

Studies showed that overprescribing and lack of knowledge are some of the risk factors for opioid misuse (Brummet et al., 2017). Education has been a fundamental component and valuable tool to empower patients throughout the centuries. Patient empowerment provides the patients with an opportunity to play a more active role in healthcare decisions to improve quality, efficiency, and outcomes related to safe opioid use postoperatively. Patient education helps patients better understand their condition, medical/surgical procedures, and treatment choices (American Nurse Association, 2018).

Recommendation 1: Improve Preoperative Education

Based on the evaluation, synthesis tables, and BOE, it is recommended to use preoperative opioid education in writing and video delivery methods for patients receiving prescriptions for opioids to relieve pain. It is best to combine these two methods because the evidence showed that the written information did not only function as memory support but also as a starting point and reference for the patients during the whole care period (Andersson et al., 2015). Written information also saves staff time because it reduces patients' need for repeated oral information. Written information has the critical advantage that the information can be read and reviewed many times

(Chumbley et al., 2004) even though most of the studies delivered education preoperatively. However, they did make the recommendation to consider it postoperatively and at the time of discharge for better results. Studies combined with video and written opioid-related information showed a reduction in opioid consumption, better knowledge of opioids, decreased pain intensity, and responsible use of opioids.

Recommendation 2: Improve Nurses' Understanding of Opioid Use

Two studies (Costello et al., 2016; Waszak et al., 2018) showed an increase in nurses' knowledge of opioids subsequently increases patients' knowledge of opioids. It is best to train the nurses for better sustainability and have a consistent opioid education in video and written form to be reviewed with the patient preoperatively, postoperatively, and at discharge. According to a survey, Kaiser stated that the nurses had a strong knowledge of pharmacology and the use of non-opioids medications for pain management. The study recommended an opportunity for further education, including risk factors, differences in opioid-tolerant and opioid-naïve patients, and early recognition/management of opioid overdose (Kaiser, 2020).

Models Underpinning the Project

Three models were chosen to provide structure to the project. These models included Larrabee's evidence-based practice model, Sullivan's nursing process as a change model, the transformational leadership model, and a logic model. The following section expands on each model, the rationale for its selection, and how it was adapted for this project.

Evidence-Based Practice Model

Larrabee's EBP model guided the project leader through the EBP process in

order to address the clinical question, "In postoperative patients in a day surgery unit (P), how does preoperative education of opioids (I) as compared to no education (C) affect patient knowledge and postoperative opioid use (O) within three months (T)?" Model for evidence-based practice change was selected because it guides the clinicians through a systemic process for evidence-based practice change and is applicable in acute care units. The few distinct features of the model are: 1) internal data is the source of information for the necessary change, and it also promotes the clinicians to focus on patient preferences and satisfaction, 2) advocates the use of standardized language to identify the problem, and 3) advocates the use of principles of the nursing process as a change model to integrate, evaluate, and maintain practice changes (Gawlinski & Rutledge, 2008).

The Larrabee model is a six-step processes. The six steps of the model are: (1) Assess the need for change in practice; (2) locate the best evidence; (3) critically analyze the evidence; (4) design practice change; (5) implement and evaluate the change in practice; and (6) integrate and maintain change in practice . This model met the criteria to guide the implementation of an evidence-based practice change at Baylor Scott & White Medical Center at Plano (BSWMCP). All six steps of the Model for Evidence-Based Practice Change are either completed or projected using an EBP change initiative timeline, as shown in Appendix C, Figure C1.

Step 1 involved assessing the need for change in practice and identifying the stakeholders such as patients, caregivers, families, nurses, nurse leaders, surgeons, and personnel from the financial department. The project was based on the clinical question associated with a preoperative patient population based on:

- Due to the lack of preoperative opioid education at BSWMCP
- Low Press Ganey scores on the communication about medications
- The local, state and national rising opioid use crisis

A PICOT format of a clinical question was generated after linking the problem with interventions and outcomes based on background and significance.

Step 2 consisted of locating the best evidence by identifying the types & sources of evidence, reviewing research concepts, planning the research, and conducting a search. A rigorous systematic search was performed using three central databases such as CINAHL, PubMed, and Cochrane. The search yielded total of 76 articles.

Step 3 consisted of critically analyzing the evidence by weighing & critically appraising the evidence, synthesizing the best evidence, and assessing the new practice's feasibility, benefits, & risks. The completion of GAO's and RCA of all keeper studies addressed this step. Evaluation and synthesis tables were used to find the best evidence-based practice. After the synthesis of BOE, a comparative evaluation was performed across all fourteen studies. The evaluation and synthesis led to the preliminary recommendation that preoperative opioid education increases patient knowledge of opioids and decrease opioid use postoperatively. The best results were from the studies that used a combination of written and video opioid education. According to BOE, opioid education did not cause any risk to the patient population.

Step 4 included defining the proposed change, identifying needed resources (personnel, material, equipment, or forms), designing the evaluation (how to measure the effect), and designing the implementation plan (Melnyk & Fineout-Overholt, 2019). This step includes the logic model, stakeholder assessment, and budget planning. A

Gantt chart was used to plan the implementation phase.

Step 5 projected dates for implementation (collecting and analyzing data) and evaluation of the project. This phase started with the organizational approvals and collection of demographic data, and pre-test scores. Shortly after the RN education was delivered online. Evaluation of a project is as crucial and challenging as implementation. The project is incomplete without evaluation. It is essential to let the stakeholders know that the project was effective or ineffective. Good evaluation requires useful and appropriate tools. Certain activities used during implementation sets the stage for effective evaluation, such as becoming familiar with the environment, good collaboration with the leaders and the participants, maintaining a connection throughout and after the project, providing incentives (CEU's), and using informed consent, and lastly, be flexible. This phase ended with collection of post-test scores and data analysis.

Step 6 involved integrating and maintaining the change. This step focused on performing spread and sustainability scores. Spread planner was used to assess sustainability at the organization. The tasks included in the spread planner were:

- Assessment of leadership for spread
- Set-up for spread
- Strengthening the social system
- Developing a communication plan
- Developing the measurement & the feedback system

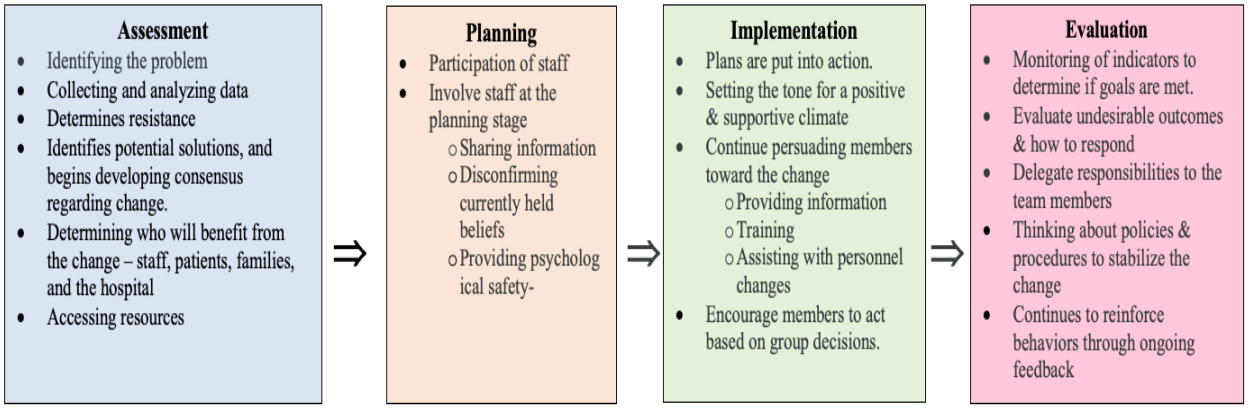
Change and Leadership Models

The model is based on Sullivan's (2012) nurse process as a change model (Udod & Wagner, n. d.). As shown in Figure 6, this model will walk the team through the

phases required to adopt the new change from the beginning to the end.

Figure 6

Nursing Process as the Change Process

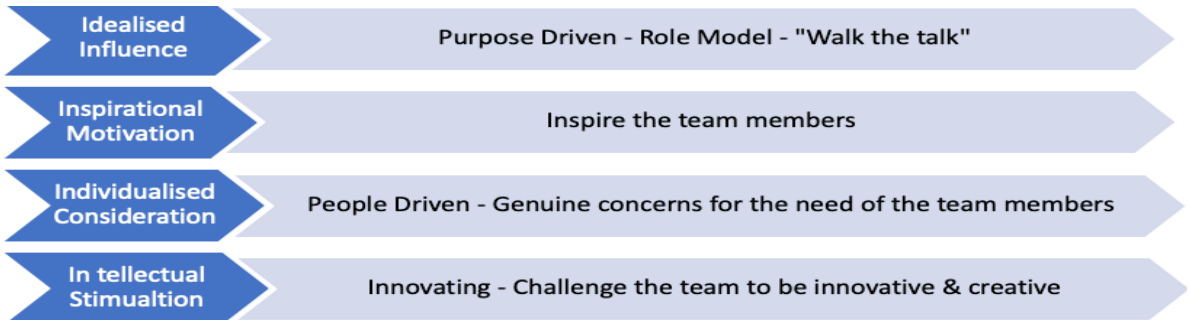


Sullivan (2012)

The change model helped identify the political environment and the strategies to strengthen the environment to promote a successful change. Strong nursing leadership is crucial for the success of the implementation of EBP in all the phases. The transformational leadership model shown in Figure 7, is a unique in providing the project leader with the required knowledge and skills to implement this change smoothly. The four I's of the transformational leadership model, acted as a precursor and guided the project until the end (National-Academies, 2004).

Figure 7

Leadership Model – Transformational leadership



Logic Model

The logic model provides a visual summary that shows the relationship between EBP's resources, activities, outputs, and outcomes. The logic model links outcomes (short-, mid-and long-term) with EBP activities/processes and the assumptions/principles of the EBP. The logic model provided the stakeholders with a road map describing related events relating to the need for the EBP with the project's desired results. The use of a logic model, as shown in Appendix C, Figure C2, is to visualize and understand how people and monetary resources can contribute to the achievement of project goals. The logic and EBP model focus on identifying the stakeholders as barriers or facilitators of the project. A project leader using a transformational leadership style and change model to bring change in the behavior proved to be crucial for the successful implementation of a preoperative opioid education project.

Chapter 3 Project Design and Methodology

Design and Methodology

The project design for the project chosen was a one-group pre-& –post-test design. The initial plan was to administer a pretest to the registered nurses on opioid-related questions and then conduct a one-hour face-to-face opioid education followed by a post-test. After this process, the nurses will start administering the pretest to the patients, providing patient education (video, verbal, and written form), and then collect post-test questions before discharge. The original plan for this quality improvement project of opioid education was to be completed in May 2020. However, due to the COVID-19 pandemic, the project design remained the same, but the delivery method has changed and the project started late. The pretest, education, and post-test were delivered via an online platform. Qualtrics were used for demographic and pre-& post-test data. The project started in October 2020.

Description of Setting

The Setting for this project is Baylor Scott & White Medical Center of Plano, Texas. Baylor Scott & White is the most prominent not-for-profit organization in the state of Texas. Since its opening in 2004 at Plano, this organization has kept on expanding and serving the community. Baylor Scott & White provides inpatient, outpatient, rehabilitation, and emergency medical services through 48 hospitals and serves 6.6 million patients annually. The unit chosen for the project is a day surgery unit, where patients are pre-admitted for surgeries.

Approximately 30 surgeries or procedures are performed daily at this unit. The unit consists of 11 full-time and approximately 15 part-time registered nurses (Baylor Scott & White, Plano, 2019).

Pre-intervention Process

The pre-intervention process for preoperative education at Baylor Scott & White medical center Plano is very generic. The patients are provided with universal knowledge about the hospital and what to expect during & after surgery. The guide to surgery can be accessed online on the hospital website too. This guide covers the education about what to expect before surgery and after surgery. Information before the surgery includes:

- Role of the nurses, anesthetist, and the surgeon
- Recovery room information and general information on pain management
- Role of the family
- Length of stay after surgery and recovery period

After the conversation with the unit supervisor and the unit manager, it was concluded that there is no specific detailed education is given on the opioids but general information on the prescribed medications only (Baylor Scott & White, Plano, 2019). Due to the COVID-19 pandemic, the team has to change the outcomes to measuring the registered nurses' knowledge only. Not only this, the research shows that coronavirus disease 2019 has changed the delivery of health care in the United States and has affected the daily operations of healthcare facilities. The guidelines recommended using video conferencing, telehealth visits, and holding elective surgeries are possible (CDC, 2020).

Stakeholders

It is essential to have the stakeholders' support whenever beginning innovation and, more importantly, make changes to the project. Stakeholders and team members played a significant role in the success of a project. The registered nurse's education project's key stakeholders were registered nurses and the nurse leaders (Dieckmann, 2016).

Active Stakeholders

Nurses of the unit were directly affected as opioid education assists in professional development and provided more confidence in caring for patients receiving opioids. The online opioid education method proved to be easy to use and cost-effective. However, in the future, the financial cost for one-hour education might be coming from the departmental budget, which the unit nurse manager allocates. Financial decisions will need to be approved by the director of nursing. Nurse Educator assistance will be needed to provide annual opioid education and evaluation of competencies of the registered nurses.

Passive Stakeholders

The nurses work very close to the clients and their families to improve their quality of life. Therefore, the nursing profession must develop a fundamental philosophy of valuing and empowering its clients. According to a study, patients who understand more about pain management preoperatively were better prepared to cope with postoperative pain, ask questions, and knew better when to notify the doctor of complications. Patient education helps patients better understand their condition, medical/surgical procedures, and treatment choices (Oshodi, 2007). The goal of this

project is to increase patients' knowledge of opioids and decrease long-term opioid usage.

The administration members, were indirectly involved as leaders of the organizations in making collective decisions. The opioid education project would have a financial impact on the organization if it were implemented a planned. Therefore, the administrative board members' involvement, the chief executive officers (nursing and medical), and the chief financial officer is a valuable resource. Patient satisfaction scores are tied to the nurse's knowledge and impact the image of an organization, and the board of trustees is invested in the organization's image.

Community, state, and national organizations working with opioid crisis-related issues will be indirectly involved, such as the Centers for Disease Control and Prevention (CDC), The Joint Commission (TJC), and American Nurses Association (ANA).

Barriers and Facilitators

Successful implementation of a new intervention requires a thorough assessment of facilitators and barriers to the new change (Dieckmann, 2016). The research shows that the successful implementation of evidence-based practice (EBP) is directly related to organizational culture's ability to change through strengthening facilitators and reducing barriers. Facilitators are the factors that support and encourage the implementation of EBP. The barriers are challenges that hinder or discourage the implementation of EBP (Rickbeil & Simones, 2012).

Facilitators to Implementing Preoperative Opioid Education

The facilitators for the project were:

Priorities.

At the time of needs assessment, no formal opioid education was provided to patients before surgery. Being an essential part of the community Baylor Scott & White medical center Plano is responsible for assisting in the national opioid epidemic. The unit's nurse manager agreed with the priority of introducing opioid education as a part of preoperative education in the day surgery unit (Dieckmann, 2016).

Evidence-based Practice Culture.

Baylor Scott & white organization has the culture of supporting evidence-based current practice. The unit manager and the nurses are open to adopting innovation. The other plus point for the implementation of opioid education was easy to use and cost-effective intervention. Professional development acquired by developing new skills and knowledge through opioid education was another facilitator of this project (Dieckmann, 2016).

Barriers to implementing preoperative opioid education

Shift in Priorities.

As the process evolved, the world faced with COVID-19 challenge, the priority shifted from opioid education to managing the new pandemic.

Institutional relationship.

There is evidence that preexisting relationships between staff and patients assisted in implementing new intervention & improved relationships within the team itself (Mathieson, Grande, & Luker, 2019). No formal leadership position and face-to-face interaction affected the implementation of the project. However, maintaining regular online weekly conversations with the unit manager facilitated the success of the project.

Environment/Setting/Time.

A busy unit or a busy day can impact project implementation. The staff's willingness to change current practice and buy-in to the project is another essential factor in the project's success. The unexpected changes in the priorities and the work fatigue affected participation in the project.

Lack of resources.

Since this project was online and the nurses were not mandated to complete the organization's activity, the cost was negligible. However, in the future, if the project is implemented as planned, one of the significant threats for implementation of preoperative opioid education intervention is a lack of sufficient resources, especially the financial resources and staff workload. The intervention involves educational material for patients and training of registered nurses, which requires funding, time, and the use of information technology (Dieckmann, 2016). Continual registered nurses' education is required for the sustainability of this project. Which requires an hour of paid education time to the nurses?

Human Factors.

The most significant barrier encountered was related to human factors such as motivation, acceptance & beliefs, and practicalities (National Health Services (NHS), 2007). According to Sagherian et al. (2020), the nursing staff who cared for patients with COVID-19 had worse fatigue than the rest of the group.

Table 1

Project Facilitators and Barriers

Facilitators	Barriers

• Prioritization • Evidence-based practice organizational culture • Pre-existing relationships • Intervention easy to use and cost-effective • Professional Developmental • Meeting organizational, community and national goals	• Environment/Setting/Time – COVID-19 Pandemic • Lack of resources • Human factors – Nurse fatigue • Sustainability

Population

Detailed demographic and additional information on the registered nurses' pretest questionnaire's population characteristics is as shown in Table 2. A total of 16 registered nurses consented to participate. Two of the nurses did not answer all the questions. The majority of the participants were females (93.75%), full-time workers (93.75%), and graduated with a bachelor of science degree in nursing (71.43%). None of the participants were prepared at the doctorate level of nursing. Seventy-five percent of the nurses responded yes to the question 'if they have received any opioid or pain-related education in the past.' The majority of the nurses, i.e., 53.33%, were in the age range of 45-54 Years.

Table 2

Demographic Data

Total Answered			No.	Percentage
Gender	16	Male	1	6.25%
		Female	15	93.75%
Highest Education	14	Diploma in Nursing	1	7.14%
		Associate Degree in Nursing	1	7.14%
		BSN	10	71.43%
		MSN	2	14.29%
		Doctorate in Nursing	0	0
Job Status	16	Full-Time	15	93.755
		Part-Time	1	6.25%
Age	15	18-24 Year	0	0
		25-34 Year	1	6.67%
		35-44 Year	2	13.33%
		45-54 Year	8	53.33%
		55-64 Year	2	13.33%
		>65 Year	2	13.33%
Race & Ethnicity	16	Hispanic, Latino or Spanish	2	13.33%
		Asian	3	18.73%
		Black or African American	1	7.14%

		Others not listed	5	31.25%
		Prefer not to respond	5	31.25%
Previous opioid use or pain management education	16	Yes	12	75%
		No	4	25%

Budget Planning

According to Dieckmann, funding is a significant challenge to the sustainability and institutionalization of a project. It is essential to plan a workable budget in the pre-implementation phase (Dieckmann, 2016). The proposed budget includes the cost for patient and registered nurses' education. In the future, for full implementation, this budget planning will be beneficial. As shown in Figure 8, the actual budget was way too less as compared to the proposed. The CEU's were free of cost. The majority of the budget was allocated to the time consumed in data collection and data analysis.

Figure 8

Proposed Budget

Item	Number Required	Projected Cost	Cost Center	Approval Needed	Notes
RN Education	11	Free CEU's or 40/hr. $440	Nursing	VP Nursing	Will be done by the leader of the project. Then by the nursing education department as an annual requirement for the nurses.
Stationary	30-50 printed opioid education, pre & posttest Material for RN's	$600	Department	Department Manager	If a paper is used to deliver education and pre/posttest.
Audiovisual	Patient can use mobile phone or Smart TV	$500	Nursing	Department budget	Or will look into the ones free from CDC and can be played on the handheld device.
Stationary, printing, & Lamination Charges	Educational Material for patients	$350	Project Manager	Project Manager	Request free material from the CDC website. Hospital has Krames on demand that has opioid-related information.
Data Collection & Data Analysis	Hours spend by the project manager	$3,500	Department	Manager	The leader will collect data and ongoing data collections by the unit staff and assigned hospital personnel for the Press Ganey surveys. Data analysis software.
Miscellaneous	Conducting education, holding meetings, team building, planning, implementation, and evaluation.	$4,000	Deaprtment	Manager	
Total		**$9,390**			
Amount Spent on opioid misuse (Texas)			**$ 2 Billion**		
Reduction in opioid use rate through this project			**0.05%**		
Savings			**$50, 000**		

Actual Budget

Item	Number Required	Projected Cost	Cost Center	Approval Needed	Notes
RN Education	11	Free CEU's or 40/hr. $440	Nursing	VP Nursing	Will be done by the leader of the project. Then by the nursing education department as an annual requirement for the nurses.

Budget Justification

RN Education.

Registered nurses are on the front lines of addressing the epidemic by educating patients to understand the risks and benefits of pain treatment options, including opioids, and recognizing those at risk for substance use disorder (American Nurse Association, 2018). Research also shows that an increase in nurse's knowledge leads to patient satisfaction and increased patient knowledge. Pretest, opioid education, and post-test require 45 minutes to an hour session (Costello et al., 2016).

Audiovisual aids.

In a recent study, the video animation significantly increased patient knowledge acquisition about opioid medications' risks and proper usage and disposal (P =. 001, Cohen D effect size = 0.92). Based on the evaluation, synthesis tables, and BOE, it is recommended to use preoperative opioid education in writing and video delivery methods (Chakravarthy et al., 2018).

Return on Investment.

The ultimate goal of any healthcare project is better patient outcomes. Baylor Scott & White medical center has a mission of healing and promoting the well-being of all the individuals, families, and communities through being a trusted leader, educator, and innovator in value-based care delivery, customer experience, and affordability (Baylor Scott & White Health, 2019). This project's goal/focus is to increase patient and nurses' knowledge of opioids, promote the responsible use of opioids, prevent misuse,

and decrease long-term use. The goal aligns with the mission and ambition of the organization. Also, the introduction of opioid education preoperatively will help improve Press Ganey scores on 'communication about medications upon discharge' question. Improved public reported data influences an organization's image and impacts patients and the healthcare providers' decisions on selecting an organization for healthcare needs.

In Texas, the number of opioid overdose deaths has increased four times since 1999. The number of opioid-related overdose deaths in 2016 was 1,375. In 2016, 91.8 million (34.1%) adults used prescription opioids, and 11.5 million (4.3%) misused them. The total cost of prescription opioid misuse is $78.5 billion a year in the United States, including healthcare costs, lost productivity, addiction treatment, and criminal justice involvement (National Institute on Drug Abuse, 2018). Texas state spent nearly $2 billion per year on total health care costs from opioid misuse. Even a 0.05% reduction can benefit the state with about $50,000 savings per year.

According to a Hobby School of Public Affairs report, about 49% of the patients did not recall any information on the safe storage of opioids. About 45% reported not getting any information on the proper disposal of unused opioids, and 61% stated that they kept the unused opioids (Hobby School of Public Affairs, 2018). Approximately 2000 surgeries were performed in 2018-2019 at Baylor, Plano (American Hospital Directory, 2019). Educating nurses and patients can reduce patients' rate, stating that they did not receive any information on opioid storage and disposal. As a nonprofit organization, Baylor Scott & White plays a growing role in the social and economic well-being of the United States. Indirectly, this project is supporting national goals by

improving patient care through education and reducing cost.

Chapter 4 Project Implementation, Outcomes, Impact, and Results

Project Impact

Project Impact Plan

The completion outcomes are divided into three categories as short-term, mid-term, and long-term. The short-term outcomes were:

- The RN's will show improved scores on post-test immediately after the opioid education
- The patient will show improved scores on post-test after the education preoperatively
- The patient will verbalize at least three methods to relieve pain other than opioids after the education

The mid-term outcomes were: 1) Registered nurses will have increased knowledge of safe opioids use, side effects, proper storage, and disposal after the opioid education as demonstrated through the post-test results; 2) Patients will have increased knowledge regarding safe opioid use, side effects, proper storage and disposal after written and video education as demonstrated by the post-test results. The long-term outcomes were:

- The RN's will educate the patients on opioids use, side effects, proper storage, and disposal preoperatively
- The patient will use non-pharmacological measures for pain relief postoperatively
- Patients will report pain-using numeric rating scale postoperatively

- The patient will store and dispose of left-over opioids properly at home; and
- Patients will report less use of opioids and discontinue before 90 days postoperatively.

Actual Project Impact

Due to the pandemic and the restrictions associated with it, the completion outcome is divided into three categories: short-term, mid-term, and long-term. The short-term outcome is the RN's will show improved scores on the post-test immediately after the opioid education. The mid-term outcome is the registered nurses will have increased knowledge of safe opioids use, side effects, proper storage, and disposal after the opioid education, as demonstrated through the post-test results. The long-term outcome is the RN's will educate the patients on opioids use, side effects, proper storage, and disposal preoperatively.

Progress Markers

Project planning form by the Institute for Healthcare Improvement (IHI) was used to track the progress markers during the implementation phase (IHI, 2019) as shown in Table 3. If in the future the project is implemented as initially planned, the ongoing progress will be monitored through quarterly press Ganey scores and annual nursing competencies.

Table 3

Project Planning and Evaluation

Drivers	Goal	Evaluation
Nurses Education	90% of the nurses in day surgery unit will complete pretest, opioid education, and posttest.	26.66% of the nurses in day surgery unit has completed the pretest, opioid education, and posttest.

(IHI, 2019)

Process indicators/milestones

- Collected patient outcome data from press Ganey (Communication on the medication by the nurses) preintervention by 05/2020.
- The registered nurse's education and collecting data from pre-& post-test initiated on 10/14/2020.

Project Management and Outcomes

Project management is applying knowledge and skills in arranging the activities efficiently within an organization. The project of opioid education requires a tight schedule to complete a large number of activities on time. A Gantt chart, as shown in Appendix D, was utilized to monitor the growth of the project. In 1910, Henry Gantt designed the Gantt chart to help the project managers see their work's progression. Gantt charts convey the planning and implementation of information visually and provide an instant overview of the project (Smartsheet, 2020).

Data Collection

The data collection plan, as shown in Table 4, involved giving a pretest to registered nurses and collected data using Qualtrics. The team leader followed up with the unit manager every week. After the pretest, the nurses were given education on opioids in the written form. The post-test scores were collected starting December 2020 to January 2021.

Table 4

Data Collection Plan

Change Idea	Tasks to Prepare	Person Responsible	Week (October 2020 – January 2021)											
			1	2	3	4	5	6	7	8	9	10	11	12
40 min. Opioid education - RN	• Education Content • Pre-& Post Test	Team Leader	X	X	X	X	X	X						
Data Collection	• Demographic Data • Nurses' pre-& posttest scores	Team Leader	X	X	X	X	X	X	X	X	X	X	X	X

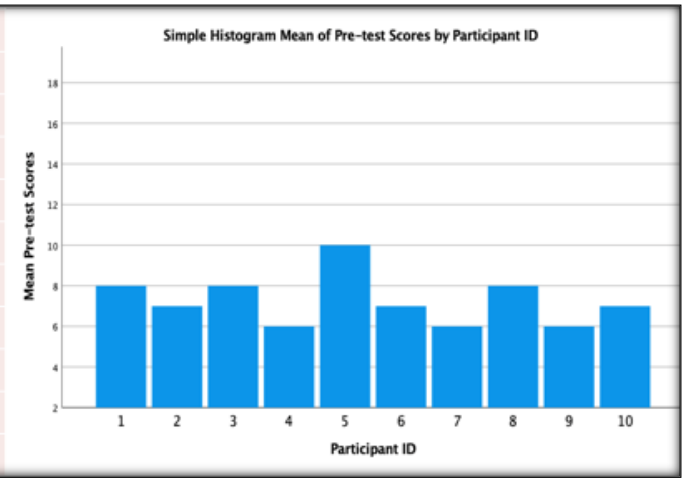
Data analysis

The data analysis methods for this improvement project are a comparison of pre- and post-test results. The mean (easy and quick), standard deviation, regression (the relationship between variables), and the p-value (<0.05) & t-test (hypothesis testing) were calculated to show the effect of preoperative education on the knowledge. As shown in table 2, sixteen nurses participated in the demographic data, but only ten nurses completed the pretest, as shown in Figure 9.

Figure 9

Pre-test Scores

ID	Pre-test	Percentage
1	8	47
2	7	41
3	8	47
4	6	35
5	10	59
6	7	41
7	6	35
8	8	47
9	6	35
10	7	41

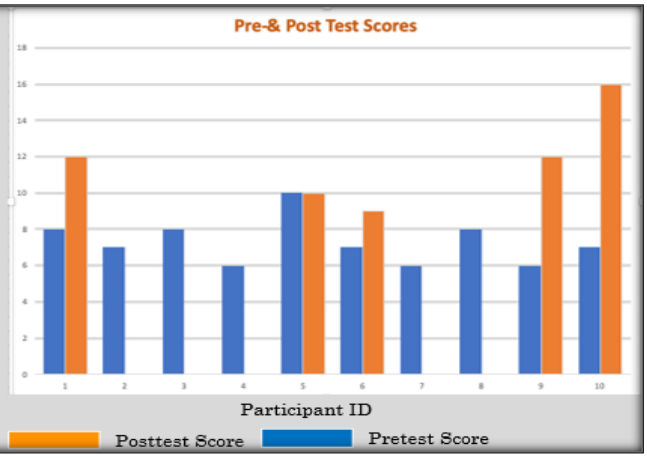


The maximum (10) and minimum (6) scores indicated a lack of knowledge among nurses related to the risk assessment tool, safe disposal, recommended 14-day opioid supply postoperatively, and risk factors for opioid use disorder. The education was delivered using an online platform and written form a week after the pretest. The education included epidemiology surrounding the use of prescription opioid misuse in the United States, terminology related to opioids, risk factors associated with opioid use disorder, and pharmacological/non-pharmacological treatment options and strategies to prevent opioid misuse among postoperative patients were discussed. Strategies included safe opioid use, storage, and disposal instructions for patients upon discharge. As shown in Figure 10, five nurses completed the post-test and shown high scores after the education.

Figure 10

Comparison of Pre-test & Post-test Scores

ID	Pre-test	%	Post-test	%
1	8	47	12	71
2	7	41		0
3	8	47		0
4	6	35		0
5	10	59	10	59
6	7	41	9	53
7	6	35		0
8	8	47		0
9	6	35	12	71
10	7	41	16	94

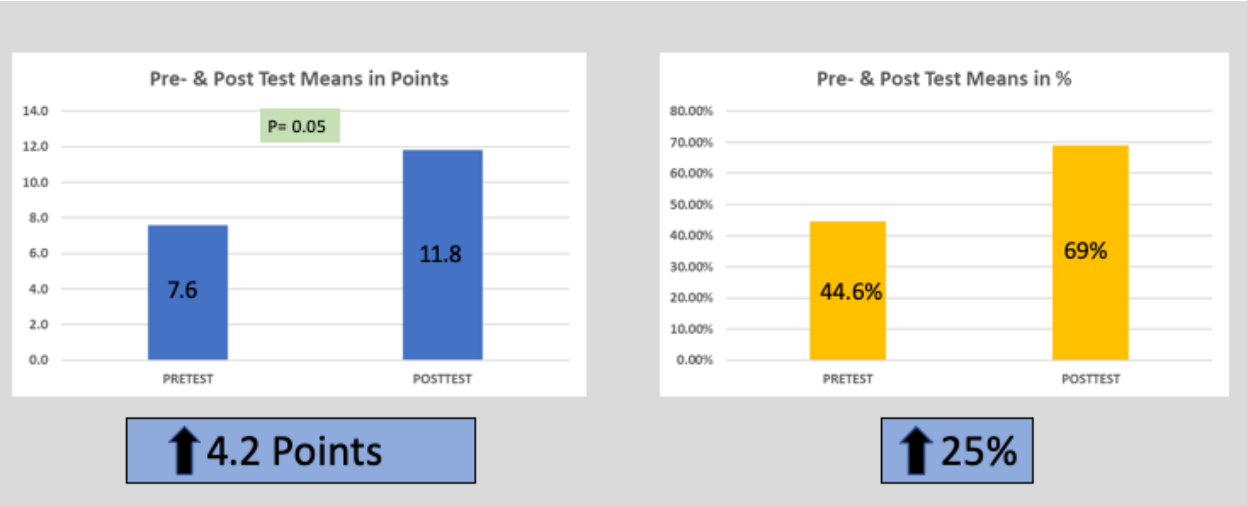


The final analysis was to compare the means. The Paired Samples correlation table adds that pretest and post-test scores are negatively correlated (r = - .332). There was a statistically significant difference between mean pre and post-test scores (t4 = 2.689, p= 0.05). On average, post-test scores were 4.2 points higher than pretest

scores (95% CI [-.137, 8.537]), as shown in Figure 11.

Figure 11

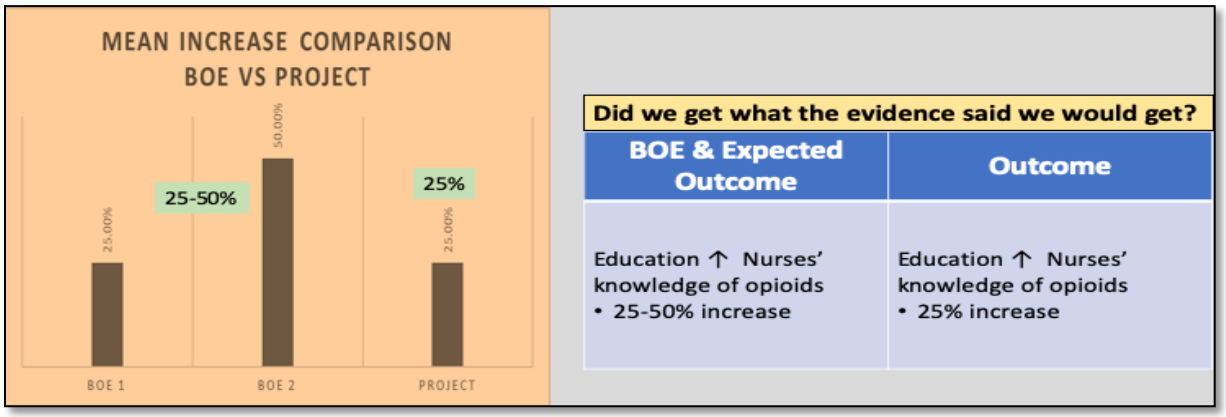
Comparing Means of Pre- & Post-tests



The body of evidence concluded that lack of knowledge makes patients vulnerable to misuse and nonmedical use of opioids. Registered nurses are on the front lines of addressing the epidemic by educating the patients. An increase in nurses' knowledge of opioids subsequently increases patient's knowledge of opioids. The body of evidence recommended 25-50% increase in knowledge after the education. The actual results supported the body of evidence recommendation by demonstrating 25% increase in mean post-education scores as shown in Figure 12.

Figure 12

Did we get what the evidence said we would get?



Chapter 5 Project Sustainability, Conclusions, and Recommendations

Project Sustainability Plan

For sustainability, the intervention was tailored towards training the preoperative nurses on opioids and pain management. However, if critical nurses involved in the process leave or the organization's priorities shift, it will be challenging to maintain the change (NHS, 2007). That is why formal policies need to be developed or created as the new standard protocol of education will help eliminate the human variables of sustainability. The plan is to implement the project as planned soon and review the institutional policy regarding opioid education based on the results. Secondly, the efforts will be made for the inclusion of continuing education on opioids and pain management as a part of target education every 2-year license renewal period on pain management & safe opioid use in the state of Texas.

Conclusion and Recommendations

The body of evidence showed about 25-50% increase in nurses' knowledge after the education. The results of this project provided conclusive and similar data as recommended by the body of evidence about the effect of opioid education on the registered nurses' knowledge. There was 25% increase in the post-test scores after the implementation of opioid education. Due to COVID 19 effect, there was low participation, low motivation, and work fatigue (CDC, 2020). The suggestions for the future are to implement the evidence-based recommendation in the similar population as initially planned.

Chapter 6 DNP Practice-Scholar Role Actualization

Role Impact

The Doctoral of Nursing Practice (DNP) DNP-prepared nurses translate acquired knowledge into practice and be change leaders. Implementation of an evidence-based project is the best way to translate knowledge into practice. The doctoral prepared nurses prepared impact health care at various levels such as clinical practice, administration, and health policy. nurses' influence on policy development and implementation promotes patient safety, quality care, and healthcare access. Nurses spent more time with the patients and are aware of their needs. With a strong background in hands-on nursing and as a DNP prepared professional, the nurses' influence policy development to promote patient safety, quality care, and healthcare access.

Summary

DNP-prepared change leaders can understand and support others if they know their strengths, weaknesses, and feelings and can manage their own emotions. The lesson learned was that any change involves intense emotions of uncertainty, especially in the 2020 midst of the COVID-19 crisis. I almost thought that it would be impossible to implement the change. I am thankful that I can make a difference at a small level by educating the educator to do their due diligence in educating the patients. As a change leader utilizing the top five strengths and EI, I have overcome a few of the challenges and completed the project with positive results.

The stages of change require self-assessment, self-management, social awareness, and relationship building. The success of a change process depends on partnership and two-way communication. An emotionally intelligent leader knows these factors and creates an environment of open communication. EI enables leaders to identify the strengths required to build a productive team (by using social skills) and overcome barriers/resistance to change (by using emotional skills). Raising awareness and dissemination of evidence-based practice requires combination of strengths, emotional intelligence, and strong leadership skills.

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Appendix A: Critical Appraisal of the Evidence

	Citation: author(s), date of publication& title	Purpose of Study	CF	Design/ Method	Sample/Setting	Major Variables Studied & Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence [study strengths and weaknesses]) Recommendations	Role of Ethics	Application to Population & Protocol Frame in Terms of Any Cultural Concerns
1.	Alter, T. H., & Ilyas, A. M. (2017). A prospective randomized study analyzing preoperative opioid counseling in pain management after carpal tunnel release surgery	Assess the effect of POCF on PPE & OC after CTRS	None used	RCT	N=40 IV1 n=20 IV2 n=20 Average Age IV1=61 IV2=62 Selection-Postop CTR Pts. Exclusion: • CTR PWS or more procedures • Preop OC • Opioid allergy. Attrition: No Setting - SC	IV1 – POC IV2 – No Counseling DV1 – PPE DV2 – OC POC – Preoperative opioid education by the surgeon using POCF. POCF – Form that explains the significance & problems associated with the opioid Have 5 formal preop recommendations PPE- Average Numerical rating score on POD 0-3 OC- Average No. of pills POD 0-3 & total	DV1- (Mean NRS) on POD 0 -3 DV2- Average No. of pills consumed on POD 0-3, & total in 3 days (via email survey)	SS= p< 0.05. Hypothesis testing= Fisher exact test & Student t test Average NRS & no. of pills POD 0-3 & total	DVI = IV1 (4.25, 3.85, 2.40, & 1.90) IV2 (4.75, 4.20, 2.65, & 1.80), p >.05 DV2 – IV1 (1.4), IV2 (4.2), p< .05	LOE = II Strengths: Prospective-RCT • DV2=SS & 100% RR • Simple Randomization • Single surgeon & same surgical technique • Standardized tool Limitations: • Surgeries done by single surgeon at a single institution • Evaluated only Tylenol with codeine • Recall bias • OS with pain not measured Feasibility: POCF is reasonable to implement. Risk/Benefit: Benefits outweigh the risks Conclusion: POC minimize OC not PPE as compared to NC. Recommendations: • Surgeons include routine preoperative counseling of their patients to help minimize opioid use. • Recommend prescribing no more than 5 to 10 opioids pills Notes: FIGURE 1: Patient opioid counseling form.	IRB approved Consented	• Counseling M=9, F=11 • No counseling M=6, F14 • Procedure CTR Only Pennsylvania opioid overdose rate 21.3 per 100,000 • White non-Hispanic population = 88% • Hispanic 4% • Black Non-Hispanic 7% Texas opioid overdose rate 2.3 per 100,000, • White non-Hispanic population 70% • Hispanic 21% • Black Non-Hispanic 8%
2.	Chakravarthy et al. (2018). Randomized pilot trial measuring knowledge acquisition of opioid education in emergency department patients using a novel media platform.	Determine if an EI via a brief VDI increase Pt. knowledge of opioids as CT SOC DI	None used	RCT	N= 52 IV1 n= 25 IV2 n= 27 Average age: IV1 = 41 IV2 = 34 Selection: Pts' cc of pain, age >18 years, UCF & on opioid Exclusion: Pregnant, with active cancer, < 18, USE, AMS Attrition -Y | & Explained Setting-ED UAH	IV1 = SOC & VDI IV2 = SOC DV1 = KN of dangers & SOU DV2 = Feasibility of implementing VDI in ED VDI=6-minute video https://youtu.be/5FYNBvgmdsE. SOC= Verbal & written instruction on opioids	DV1= Questions based on SAMHSA information from Numeric scale from 1 to 26 DV2= RR= % Enrolled	Effect size Cohen's d p -value An unpaired t test to determine if there was a SS difference between the 2 groups Mean % scores for knowledge	Cohen's d = 0.92 DVI= IV2 65% (SD=4.53) & IV1 82% (SD=4.98). IV 1 > IV 2, t (50), p= .001) DV2=Feasible RR= 96.1%	LOE = II Strengths – RCT • No difference between groups (P < .05) • Results SS Limitations • Single site pilot study • Convenience sample • Didn't assess baseline opioid knowledge but assigned randomly Feasibility: VDI showed higher knowledge regarding the safe use of opioids. Reasonable to implement. Risk/Benefit: Benefits outweigh the risks Conclusion: SOC & VDI increased knowledge of opioids as compared to SOC Conclusion: Recommendations • This approach to educating patients about opioid use & misuse is a promising method to potentially initiate patient behavioral changes. • Future studies - whether VDI improve LTOKR & elicit positive behavioral changes. Notes: Content & survey from SAMSHA	Followed IRB guidelines Consented	• Patients c/o pain • The population was made up of 44% white, 40% Hispanic, 6% Asian, 6% black, and 4% other. • Pts chosen from ED • Not preoperative unit California drug overdose rate 5.3 per 100,000 • White non-Hispanic population = 66% • Hispanic 22% • Black Non-Hispanic 7%

Appendix A: Continued

	Citation: author(s), date of publication& title	Purpose of Study	CF	Design/ Method	Sample/Setting	Major Variables Studied & Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence [study strengths and weaknesses]) Recommendations	Role of Ethics	Application to Population & Protocol Frame in Terms of Any Cultural Concerns
3.	Chumbley et al. (2004). Pre-operative information and patient-controlled analgesia: Much ado about nothing.	Determine if Pts. felt better informed about PCA. Examine if whether POI helped with use of PCA, PR, knowledge of SE, & worries about O&A Compare the effectiveness of information provided in two ways.	None used	RCT	N= 225 IV1n= 75 IV2 n= 75 IV3 n= 75 Average age IV1= 59 IV2 = 58 IV3 = 54 Selection Postoperative pts. With PCA Exclusion Too ill, confused, UTRUE Setting Acute care hospital	IV1 – PIL IV2 – PI IV3 – RPI DV1 – KN & confusion DV2 –Total OME DV3 – Anxiety, pain, SE IV = Same information in different formats RPI= No PIL, Verbal information PIL=Information on use of PCA, adequacy of pain relief, worries about addiction & safety, & knowledge of side effects Generated from patient response study & tested in 2002	DV1 – St George's Hospital PCA Q DV2 – TMC in mg DV3 – POMS, HADS, & VAS	Mean values of cluster, CI RMAV & AV Post hoc multiple comparison test (Gabriel) - which means differ SS = p-value 0.05	DV1= IV3-2.45 (2.10–2.80), IV1-2.88 (2.73–3.03), IV2- 2.78 (2.57–2.99), p= 0.02 ↓confusion for IV1, p = 0.03) DV2=No SSD in Total OME or duration of PCA (p= 0.47) SS difference in Total OME in Abd. surgery, using the most, p < 0.01 DV3=No difference in anxieties, pain, & SE of PCA POI was ineffective.	LOE=II Strengths – • Design • Large sample • SS Limitations • Maybe information provided in IV1 was sufficient • CR=Lack of sufficient power • Year 2004 Feasibility: Patients felt better informed & less confused after PIL. Reasonable to implement. Risk/Benefit: Benefits outweigh the risks Conclusion: PIL increased PT. KN, decreased confusion. Recommendations • Patients felt better informed & less confused after PIL but this had no effect on pain relief, anxieties about addiction & overdose and knowledge of SE. • Use verbal and written method • POI was ineffective. Notes-Look for PIL in the old study	LREC approved Consented	Population characteristics based on race/Ethnicity (n = 225) Control • Caucasian 58 • Afro-Caribbean 8 • Asian 9 Leaflet • Caucasian 58 • Afro-Caribbean 11 • Asian 96 Interview • Caucasian 55 • Afro-Caribbean 14 • Asian 6 • Population selected from preoperative area but only the ones on PCA London opioid related deaths 34.9 per 100,000
4.	McCarthy et al. (2015). Improving patient knowledge and safe use of opioids: A randomized controlled trial.	Evaluate the effect of DMLAE on patients' knowledge of & safe OU	None Used	Prospective RCT	N= 210 IV1n= 110 IV2 n= 100 Average age IV1= 44 IV2 = 59 Selection Pts. DC home on a HA from ED. Exclusion < 18; USE, clinically unstable, PSI or intoxicated, admitted, and/or UTC a F/U phone interview Setting UAMC	IV1= MedSheet (written & spoken by RA about HA) IV2 = UC DV1= Pt. KN of SE DV2 = Safe OU DV3= PRTI IV1= MedSheet met a less than eighth grade readability standard. Developed using health literacy best practices ("MedSheet," funded by AHRQ R18HS17220). PRTI=What was patients' reaction to the MedSheet – I liked it or better knowledge (BK)	DV1= Five-point Likert scale DV2= SOQ DV3 = Q's regarding SSO, AC, or driving WOO	Percentage, mean, SD, median, & IQR, CI 95% Bivariate analyses (chi-square test, Fisher's exact test, & t-tests)	DV1= IV1 median-2, IQR-1 to 2; Vs IV 2 median-1, IQR 0 to 2, p < 0.000 DV2= IVI less driving after HA (IV1-CI = –0.3% to 6.3%; vs IV2 CI = 7.2% to 20% diff = 10.6, CI of diff = 3.4-17.9). DV3= PRTI=BK IV1 38%, CI=28.3%-47.7% vs IV2 18.2%, CI=10.9%-25.5% CI of difference = 21.5-33.7) No SS between groups R/T KDA with HA	LOE=2 Strengths – • RCT Study design • BR (block size = 4) Limitations • Single site, limiting generalizability. • Loss to f/u but equally distributed in both arms. • Recall bias for f/u Feasibility: Feasible since patients who received MedSheet demonstrated increased knowledge of safe OU. Risk/Benefit: Benefits outweighs risks. Concussion: MedSheet increased patient knowledge of opioids /SE & patient liked using it. Recommendations Integration of a patient education document into conversations about opioids holds promise for improving patient knowledge about these high-risk medications. Notes-Look at MedSheet	IRB approved Consented	• 42% male & 51% white, 31% African American, & 18% other. • MedSheet at readability level • Pt. population d/c from ED • Population prescribed HA only New York opioid overdose rate 16.1 per 100,000 • White non-Hispanic population = 68% • Hispanic 16% • Black Non-Hispanic 12%

Appendix A: Continued

	Citation: author(s), date of publication& title	Purpose of Study	CF	Design/ Method	Sample/Setting	Major Variables Studied & Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence [study strengths and weaknesses]) Recommendations	Role of Ethics	Application to Population & Protocol Frame in Terms of Any Cultural Concerns
5.	Sawhney et al. (2017). A pain education intervention for patients undergoing ambulatory inguinal hernia repair: A randomized controlled trial.	Examine the effectiveness of IPP HREI on postop pain after IHR.	Dodd et al. (2001) Symptom Management Model.	RCT	N= 82 IV1n= 40 IV2 n= 42 Average age: IV1= 61 IV2 = 59 Selection: Postop. IHR male Pts. ASRUE, WTP, & had phone Exclusion: Repeated or emergent IHR Attrition-Yes Explained Setting: Two hospitals in Southern Ontario, Ca.	IV1 = UC & HREI IV2 = UC DV1 = Pain intensity DV2 = AU & AE DV3= PRIWA DV4 = Use of NPM The HREI – A booklet An individualized face-to-face education session, & two phone calls. Provided by a NP with a specialty practice in acute pain management. UC- One-on-one preop. Ed from a RN in office for 30 min & F/U call.	DV1 = NRS DV2 = AU & AE Questionnaire modified tool developed by Watt-Watson DV3=BPI DV4 = Asking participants if using any NPM	Demographic: Percentage, mean/SD median/ IQR Bivariate analyses (chi-square test, Fisher's exact test, &t-tests) for difference	DV1=IV1 mean NRS (4.7 (±2.2) vs IV2 (7.2(±2.8), p = 0.0001) DV2=IV1 (9.2 mg, SD=11.2, p=0.004), vs IV2 (23.1 mg, SD=26.5). DV3=IV1 SS lower PRIWA (p=0.006) & walking ability (p=0.008). DV4=Both IV1 & IV2 used NPM.	LOE=2 Strengths – Blinded RCT Use of a standardized education intervention (HREI) Limitations • Inclusion of only men who ASRUE • Focus on Hernia repair Conclusion: UC & HREI decreased NRS, PRIWA and OU. Recommendations • Provide patients with specific verbal & written information regarding managing their pain helps in decreasing NRS & AU. • Telephone F/U provides ongoing support. • Modifying & re-testing the HREI is required. Feasibility: The HREI was found to be effective in decreasing NRS & PRIWA. SS in AU between IV1 & IV2 GP. Feasible may be little time and resource consuming. Risk/Benefit: Benefits outweighs risks.	REB approved	Only one procedure-Hernia Repair Ontario, Canada opioid overdose rate 10.3 per 100,000 • More in Age 25-44 • 73% Males • 27% Females No distribution by Race/Ethnicity
6.	Syed et al. (2018). The effect of preoperative education on opioid consumption in patients undergoing arthroscopic rotator cuff repair: A prospective, randomized control trial.	To determine if PNE reduces OU following ARCR.	None	RCT	N= 140 IV1n= 70 IV2 n= 70 Average age IV1= 59 IV2 = 58 Selection > 18 years & candidates for an ARCR. Attrition: Yes Reported Exclusion: Pts. with IRCT, ATM, h/o GI issues, or evidence of GA Setting: Rothman Institute	IV1= 'SP&P PMP' & PNE IV2 = SP&P PMP DV1= Total N/C over 3M postop. DV2 = Total N/C at 2 & 6 weeks & VAS score PNE= Education detailing recommended postop opioid usage, side effects, dependence, and addiction. 2-minute narrated video & a handout detailing the risks of narcotic overuse and abuse	DV1 = No. Of pills over 3-month period DV2 = No. of pills at 6-weeks & VAS Score	Sample-Priori power analysis with an effect size of 0.5 using α of 0.05 & β of 0.80. Independent t test, a χ 2 test Uni & Multivariate linear regression model Box plots used	DV1=IV1 19% (p=. 1), 33% (p=. 02), & 42% (P=. 01) fewer N's than IV2 at the 2 W, 6 W & 3M VAS in IV1 & IV2 @ 2 W (p =. 008) & 6 W (p =. 001), @3M (p =. 99). In 2-6W F/U IV1 had 1.67 better odds of D/C N than IV2 (OR=1.67; 95% CI, 0.83-3.38; P=. 15). 6W-3M IV1 was 2.19 x more likely to D/C N than IV2 (OR, 2.19; 95% CI, 1.10- 4.39; P = .03) @3M- pts taking N preop was 6.8 x more likely to D/C (OR, 6.80; 95% CI, 1.57-29.43; p = .008).	LOE=II Strengths – • Design RCT • Sample size - PPA performed to detect a difference with an effect size of 0.5 using α of 0.05 and a β of 0.80. • Outcome measures were compared between the groups using an independent t test or a $\chi 2$ test Limitations – • Self-report of TNNC data • To reduce bias, the researchers blinded the Pts. from the true purpose of the study. Conclusion: PNE decreased OU & pts were more likely to stop OU within 3M postop. Recommendations: Educating Pts on NC after surgery, SE, dependence, & addiction has important large- scale implications. Education can potentially be used for all elective orthopedic interventions. Feasibility: Feasible since PNE significantly decreased the Total N/C consumed@ 3M after ARCR. PNE resulted in earlier cessation of opioids. Risk/Benefits: Beneficial	IRB approved (IRB #2405; ID: Control # 15D.407). ClinicalTrials.gov Identifier: NCT03105791.	All male patients at Rotham Institute Philadelphia Philadelphia drug overdose rate 10.2 per 1000 Highest in 45-54, white, Non-Hispanic Males

Appendix A: Continued

	Citation: author(s), date of publication& title	Purpose of Study	CF	Design/ Method	Sample/Setting	Major Variables Studied & Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence [study strengths and weaknesses]) Recommendations	Role of Ethics	Application to Population & Protocol Frame in Terms of Any Cultural Concerns
7.	Costello et al. (2016). Patient opioid education: Research shows nurses' knowledge of opioids makes a difference.	To determine if an educational intervention improved nurses' and subsequently patients' knowledge of the safe use of opioids.	None used	QE pretest-posttest design	N=53=Nurses N=193 = pts. IV1 = 93 pts IV2 = 100 pts IV=Pre-IT & post-IT responses Selection - All nurses on IU. All postop Pts. D/C with OP 93 Before Ed. &100 After Ed. Setting – GISU at AMC in the NE US	Pre IT = CGI & pretest Intervention = 40-min. OEd. Nurses & OEd & Pts. (IS) Post IT- Posttest & questionnaire DV=Y/N & correct/incorrect DV1 = RN KN DV2 = Pt. KN CGI - LOM, ROA, & schedule. 40 min OEd: RofA; CPCT (e.g., opioid dependence, tolerance, withdrawal, tapering, addiction); S/S of overdose; PU, SSO & DO	Pre-& post-test DV1 = Pretest of 11 DQ & 10 KN of Safe OU Q.	Cronbach's alpha (a=.70) DV2 = Ques. On Safe OU Chi-square tests & p values each question.	DV1 & 2 - The % of IV2 GP ↑in the following categories: SSO (↑36%) DO (↑28%) ↓OU & ↓Pain (46%) AOUOP (↑48%), & NSO (↑49%).	LOE=III Strengths – Quasi-Experimental Results SS Limitations • Self-reported nature of the surveys • Small Sample Size • Sample - One institution with one cohort of postoperative Pts. Conclusion: Nurse's opioid training and patient opioid instruction sheet increased knowledge of opioids, rates of SSO, DO, AOUOP, NSO and decreased OU & pain. Recommendations- • This study found patients have a clearer understanding of safe opioid use when nurses also have a better understanding of safe practices around prescription opioids. • Results supported the use of an educational activity to increase nurses' knowledge of patients' safe use of opioids. Feasibility – Feasible, Maybe time and resource consuming but good outcomes. Risk/Benefits: Benefits outweighs the risk	IRB approved	Nurses working on gastrointestinal surgical unit Patients post-surgical procedure Massachusetts opioid overdose rate 28.2 per 100,000 • White non-Hispanic population = 80% • Hispanic 12% • Black Non-Hispanic 6%
8.	van Dijk, et al. (2015). The effect of a preoperative educational film on patients' postoperative pain in relation to their request for opioids.	To explore the effect of PEF on the relation of Pts. Postop. NRS score to the request for AO; pain scores; & FKA concerning OU	None	Quesi-RCT	N= 507 IV1n= 264 IV2n = 243 Attrition IV1 = 55 IV2=39 No surgery Final N=377 IV1n=194 IV2n= 183 Average age IV1= 53 IV2 = 51 Selection– >18, elective surgery Exclusion: HVI or URUD Setting – OPC at UMCU	IV1= 6-min OEd Film IV2 = 3-min. Control film DV1 = BFKN & pain Rx DV2 = pain NRS at rest & at movement R/T need for opioids Definitions IV1= 6-minute Educational film on pain assessment & pain medication. IV2 = 3-min. Control film on hospital's infotainment system.	DV1= BQ, FOSQ, Pain PKQ BQ= 6-point Likert scale. Cronbach's alpha=0.68. FOSQ= 6-point Likert scale. Cronbach's alpha=0.85. PKQ= 6-point Likert scale. Cronbach's alpha=0.36. DV2= NRS, VRS	Descriptive Frequency %, Means & SD Median & IQR Statistics Mann Whitney test, c2 test Chi-squared test, R/R with a 95% CI.	DV1=Median BQ IV1=1 (IQR 0-2) & IV2=2 (IQR 1–3), p < .001 Median of FOSQ in both 1.5 (IQR 0.5-3), p=. 9 Median of pain PKQ (BFKN) IV1=5 (IQR 4.5-5) & IV2=4 (IQR 3-4.5), p < .0001 DV2=31% in IV1 NRS > 4 & 33% in IV2 took no AO IV1&2= 19% of Pts with UP had no extra OU	LOE=3 Strengths – Design • Large Sample size • Reliable measurement tools Limitations • Wait time between intervention & surgery • Cronbach's alpha of the PKQ was low (a=0.36), • Limit generalizability - Study population > educated than the general population Conclusion: 6-min Ed Film decreased OU, barriers to pain management and increased pain knowledge. Recommendations • Ed Film is a valuable tool to prepare patients before surgery. • It is recommended that patients watch the film more often, at least one more time close to the day of surgery. Feasibility: Feasible & cost effective. Benefits outweigh risks. USPTF Grading: A Notes – Look at the film used	IMEC approved Clinical Trials Registry with registration number NTR3095.	All male Netherlands - drug-induced mortality rate 22 per million in 2017. Aged 15-64 years No specific data on opioid related deaths Demographics – Dutch, 79.3% Europeans 5.7% The Turks 2.4% Indo-Europeans 2.3% Moroccans 2.2% Surinamese 2.1% Caribbean 0.9% Poles 0.6% Chinese 0.3% Iraqis 0.3%, Other ethnic 3.9%

Appendix A: Continued

	Citation: author(s), date of publication& title	Purpose of Study	CF	Design/ Method	Sample/Setting	Major Variables Studied & Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence [study strengths and weaknesses]) Recommendations	Role of Ethics	Application to Population & Protocol Frame in Terms of Any Cultural Concerns
9.	Hartford et al. (2018). Standardization of outpatient procedure (STOP) narcotics: A prospective non-inferiority study to reduce opioid use in outpatient general surgical procedures.	Hypothesis: Introduction of the STOP Narcotics protocol would be associated with equivalent pain control, and reducing narcotic prescriptions among Pts. SOGSP	None used	Prospective pre-& post-intervention study .	N= 536 IV1n= 224 IV2 n= 192 Average age IV1= 50 IV2 = 51 Selection- 18 to 75 yrs. having EOLC or OHR Exclusion Pts. With regular OU, CP CKD or PUD Setting At LHSC & SJH Ontario, Canada	IV1= STOP N IT IV2=No STOP IT DV1= OQPPM, FKA & PF in first PO week. DV2=Total OU DV3= PRAP in first 7 days. DV4= Rx'ed Total OME by surgeons IV1=The STOP has 4-pronged strategy: • Patient education • HCP Ed (surgeons, anesthetists, residents, & nurses) • IMA & ORS • PMA & ORS	DV1= Survey captured: • PRAAU • NRx filled (y/n) • % Narcotic used • No. NPR • DOP DV2= OMEs were calculated DV3=NRS, MBPIS 4 weeks postop. DV4= Prescriptions for total OME by surgeons, tracked via review of EMR	Medians, IQR Means & SDs Mann-Whitney U tests & independent samples t-tests Chi-square tests, 2-sample, equal variance, t-test p=<0.025 SS	DV1=OQPPM improved in IV1 (good/very good pain control 69% vs 85%; p < 0.001). FKA-Clinically Improved. DV2= Median total OME for NRx in IV1 (100; IQR 75-116 pre IT vs 50; IQR 50-50 post IT; p < 0.001) PF No SS change, except IWA, IV1 (4.0 vs 3.3; p=0.01 DV3was non-inferior in the IV1 compared IV2 (2.3 vs 2.1 of 10; p=0.12). DV4= No. of surgeons Rx'ing > 50 OMEs was 100% pre IT to 31% post IT (p < 0.001).	LOE=IV Strengths: • Standardized, division-wide initiative • Standardized intervention was used. • Large Sample size • Two different locations Limitations: • Design - inherent bias observational • Limits in external validity R/T exclusion • Compliance issue by patients, nurses, or surgeons. Conclusion: STOP N IT decreased OU and increased OQPPM, walking ability, & resulted in decreased OME prescribed by the surgeons Recommendations: STOP I increase patient satisfaction & reduce opioid use. Feasibility: Feasible, maybe time and resource consuming. IMA & ORS and PMA & ORS may give some challenges in implementations. Benefits outweigh risks. USPTF Grading: A	The STROBE guidelines were followed. HSERB approved (HSREB# 109651).	All male Hernia Repair and laparoscopic Cholecystectomy Ontario, Canada opioid overdose rate 10.3 per 100,000 • More in Age 25-44 • 73% Males • 27% Females No distribution by Race/Ethnicity Province Demographics – All immigrants American – 16.7% Europeans – 23.6% Asian – 53.3% African – 6.1% Oceanic – 0.3%
10.	Yajnik el al. (2018). Patient education and engagement in postoperative pain management decreases opioid use following knee replacement surgery.	To test the hypothesis that improved clinician-patient communication will result in decreased OU.	None used	Retrospective Cohort study	N= 40 IV1n= 20 IV2n = 20 Average age IV1= 67 IV2 = 68 Selection- Inpatient Post TKA Pts. Exclusion Pts. Not on surgical unit & No TKA Setting VHA hospital with PSH model of care	IV1= SMAR & Pt. Ed. Card IV2= SMAR DV1= Total OME in mg @ POD1-2 DV2= daily Total OU, AD, LOS, Pain score, UOA. PEC= Printed 2-sided laminated card Front listed scheduled & PRN analgesic medications, indications & schedule or frequency Back had DVPRS (NRS & DPPI)	DV1=TOD in MME DV2= Total MME /d AD in meters LOS=(days) MMPS= (0-10) UOA= ROC	Chi square test or Fisher's exact test (n<5 in any field) p < 0.05 =SS	DV1 = Total OME in mg for POD1-2 [median (10th-90th %tile)] =71 (32–285) for IV2 & 38 (1–117) for IV1 (p=. 001). Difference [mean (95%CI)] of 67 (24– 110) OME in mg. DV2 = No SS difference in MMPS, UOA, LOS, AD POD 1-2	LOE=IV Strengths • SS difference in TOD • Reliable measurement tools • QI=PDSA used Limitations • A single center • Retrospective study • Small sample size. • Limit generalizability - mostly male pts. • Increased duration of clinician-patient encounters may have influenced our results. Conclusion: Pt. Ed Card resulted in decrease in total OME use. Recommendations • Pt. Ed Card can reduce OU • Patient education on the day of surgery & continued throughout the post-operative period can reduce opioid usage. Feasible low cost, statistically and clinically significant for opioid use. Beneficial USPTF Grading: B	IRB approved Consented	All male TKA only California drug overdose rate 5.3 per 100,000 • White non-Hispanic population = 66% • Hispanic 22% • Black Non-Hispanic 7%

Appendix A: Continued

	Citation: author(s), date of publication& title	Purpose of Study	CF	Design/ Method	Sample/Setting	Major Variables Studied & Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence [study strengths and weaknesses]) Recommendations	Role of Ethics	Application to Population & Protocol Frame in Terms of Any Cultural Concerns
11.	Costello, M. (2015). Prescription opioid analgesics: Promoting patient safety with better patient education.	Illustrates the importance of educating patients on safe use of opioid pain relievers.	None Used	A Case Study	N= 1 Age IV1= 36 Selection-Postop revision of a temporary ileostomy. Setting-Inpatient unit	IV1=Opioid education DV1= PUSMO	• Started with an open-ended research question • Led to the use of an explanation-building technique. E.g. Ms. Winston was opioid tolerant; and it's likely that she was also physically dependent on her medication. How did this happen to her?	A composite based on the researcher's experience.	• Illustrated risks of nonmedical use of opioids. • Through individualized care can be treated as outpatients & successfully weaned off opioids.	LOE=VI Strengths • Very well explained with the support of evidence-based literature. Limitations • A single case study • Lower level Evidence Conclusion: Opioid education improved PUSMO and assisted in safe weaning of opioids. Recommendations • Thorough patient education is more important when discharging patients with prescriptions for opioids. • Nurses must not only educate patients but also include family caregivers in discussions on how to recognize symptoms of over sedation. • For a summary of patient recommendations, see Safe Opioid Medication Management. Feasible: Yes, Opioid education improved knowledge and understanding of safe opioid use. Benefits outweighs the risks	The author has disclosed no potential conflicts of interest, financial or otherwise.	• Single Female case study • Revision of temporary ileostomy • Massachusetts Hosp.
12.	Andersson et al. (2015). The importance of written and verbal information on pain treatment for patients undergoing surgical interventions.	To examine patients' POPIP & Rx as well as its importance for the way pain was managed in the POP	None Used	Descriptive Qualitative Study	N=18 Average age 71 year Selection Pts. Aged 46-82 Total Knee or Hip Arthroplasty All subjects spoke Swedish Every second participant received verbal information preoperatively the others were provided with written & verbal information. Attrition-No Setting - Public hospital	IV1=pain Ed, Verbal & written information IV2= pain Ed. Verbal preoperative discussion DV1= Pts. POPIP Rx as well as its importance for the way pain was managed in	DV1=Pt. Interviews Second or third day after surgery	Content analysis Validity-Researchers & Supervisor repeatedly read & discussed material & categorization after which adjustments made until consensus was reached. Reliability - Quotations from the interviews extracted & used to illustrate the results.	DV1 = Categorized data divided & analyzed on the basis of IV2 & IV1 groups to search for characteristic, patterns & variations of PEOPR within the GPs. Four main categories 1. Form of IF 2. Content of IF 3. PEOPR 4. Factors influencing PEOPR.	LOE=VI Strengths: • Open questions were used to allow plenty of time to formulate answers. • Direct Quotations used Limitations: • The timing of interview POP 2-3 may have had a negative effect on the responses. • Interviewed in the units (stressful environment) Conclusion: • Verbal & written education improved patients' perceptions of preoperative information about pain. • Written information also saves staff time because it reduces patients' need for repeated oral information. Recommendations: Evidence-based material is a good tool because it contributes to high-quality patient information, thus ensuring better-prepared patients and increased patient safety. Feasibility: A combination of written & verbal information was perceived as valuable by the Pts. & stated that the information provided them with increased knowledge as well as the opportunity to take part in their own care. Benefits outweighs the risks	IRB approved (No. H15 2010/208) Consented	• 9 males • 9 females • Total hip or knee joint plastic surgery • Sweden drug overdose 100.5 deaths per million in 2014 • No specific data on opioid related deaths • Demographics - No official statistics on ethnicity • 20.1% foreign background in 2012. Finnish and Sami minorities, and foreign-born or first-generation immigrants like Turks, Greeks, Finns, Yugoslavs, Danes and Norwegians.

Appendix A: Continued

	Citation : author(s), date of publication& title	Purpose of Study	CF	Design/ Method	Sample/Setting	Major Variables Studied & Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence [study strengths and weaknesses]) Recommendations	Role of Ethics	Application to Population & Protocol Frame in Terms of Any Cultural Concerns
13.	Waszak et al. (2018). A quality improvement project to improve education provided by nurses to ED patients prescribed opioid analgesics at discharge.	To develop, implement, & evaluate an evidence-based approach to educating patients discharged from the emergency department with opioid analgesic prescriptions. To increase patient comprehension of safety information about opioids before D/C from the ED	Dual model Teach -Back Approach	A quality improvement project	N1= 36 Nurses' N2= 52 Pts. IV1= Nurse's Training IV2 = Pt. Ed. Selection ED nurses > 18 yrs. or older, D/C with opioid prescription Attrition-No Setting ED of UPMC Presbyterian Hospital	IV1=15-minute face-face Nurse's training Verbal & Written Pt. IS IV2=No Ed DV1=Nurses' KN DV2=Patient KN The ED NDE = verbal explanation of 3 important safety points about opioids—how to take, what to avoid, how to store medication, & the importance of not sharing medication. SSPIS - On the safe use, storage, & disposal of the opioid was provided in the written material using a dual-modal, patient teach-back approach.	DV1-Pre-& posttest DV2= Paper survey 4-Point Likert Scale	Survey (Cronbach's α) Descriptive statistics Frequencies Mean, SD Paired t-test P value 95% CI	(Cronbach's α =0.88) DV1= Pretest average 73%, & post-test 98%. Paired t-test - Pre-& post-test scores, t 10.875 (p= 0.000) DV2 = 100% understood how to take meds. 80.8% how to take, store, or dispose safely.	LOE=VI Strengths Tool=Good internal consistency (Cronbach's Alpha 0.88 on D/C information) & good acceptability. Limitations • No track of identification • The sample of patients was small and did not include patients younger than 18 years of age. • Also, the project only included 1 location/unit. • The delivery of the training for nurses was not the same Conclusion: 15 min face-to-face Nurses' training and Pt. Ed through IS by teaching back approach improved pt./Nurses' KN of opioids. Recommendations • Evidence-based, opioid-specific education should be consistently provided to all patients prescribed opioids as a standard of practice. • Improving the delivery of opioid prescription education will enhance patient knowledge & promote safety Feasibility - Low cost simple sheet showed statistically significant difference in knowledge about opioids. Benefits outweigh the risks.	NTSAC, EBNC, & QRC Approved IRB not required;	86% of the ED nurses Adult pt. Pennsylvania opioid overdose rate 21.3 per 100,000 • White non-Hispanic population = 88% • Hispanic 4% • Black Non-Hispanic 7% Texas opioid overdose rate 2.3 per 100,000, • White non-Hispanic population 70% • Hispanic 21% • Black Non-Hispanic 8%
14.	Rose et al. (2016). Opioid information pamphlet increases postoperative opioid disposal rates: A before versus after quality improvement study.	To determine if introduction of a SLOEP would increase the OISS, OTISS, RPOS & DSOW practices in PO hip & Knee arthroplasty Pts.		A Quality improvement project	N= 226 IV1n= 106 IV2 n= 120 Average age IV1= 62 IV2 = 64 Selection > 18 yrs. with total hip or knee arthroplasty Exclusion • ICV by phone • Contraindication • Pts. using > 30 mg OME/D • Surgery due to cancer Setting UBC Hospital	IV1= SM & OEP IV2= SM DV1= SSO, DO & SOW DV2=PSWI (OISS & OTISS). SM – Without OEP, Before introduction of OEP OEP – An opioid education pamphlet on safe opioid storage, opioid weaning, and disposal Piloted in preop & postop Pts.	DV1= Phone survey before & after IT Self-reported RPOS, DSOW, PSWI Ease of weaning was rated on a scale of 0-10 (0 = extremely difficult &10 = easy)	The power calculation (α = 0.05, power 80%). Percentages Means, SD Chi-square test Student's t-test Mann Whitney U test SS=p=<0.05 95% CI	DO↑from 5% to 27% in IV1 (DIP, 22%; 95% (CI), 5 to 38; p = 0.005). SSO didn't improve in IV1 (p = 0.713). SOW unchanged [before, 42/86 (49%) vs after, 45/86 (52%); p = 0.735]. OISS improved from 6.2 (3.1) in IV2 to 7.8 (2.8) in IV1 MD, 1.6; 95% CI, 1.0 to 2.2; p = 0.029). OTISS improved IV1 from 3.0 (3.9) to 7.6 (3.2), (MD, 4.6; 95% CI, 3.9 to 5.3; p < 0.001).	LOE=VI Strengths • Homogeneity of population • OEP tested via PILOT study • OEP had a significant impact on disposal & OISS. Limitations 1. Controlled Study Design. 2. A single-center study 3. Self-reporting Conclusion: OEP increased rates of disposal of opioids & improved opioid OISS & OTISS. Recommendations • OEP improved self-reported proper opioid disposal rates • The pamphlet improved OISS & OTISS. Feasibility – Feasible, simple, low cost and significantly improved disposal rates, OISS & OTISS. Benefits outweigh the risks	CREB (H14-02134) & VCHRI (V14-02134). Approved Consented	University of British Columbia All male British Columbia opioid-related death rate 30.6 per 100,000 • Male 80% • Female 20% Province Demographics – All immigrants American – 8.6% Europeans – 24.7% Asian – 61% African – 3.3% Oceanic – 2.4%

Appendix A: Continued

AC=Alcohol Consumption; AD=Ambulation Distance; AE =Adverse Effects; AMC= Academic Medical Center; AO=Additional Opioids; AOUOP= Avoidance of Opioid Use Other than for Pain; AMS= Altered Mental Status; ARCR= arthroscopic rotator cuff repair; ASRUE- Able to Speak, Read, and Understand English; ATM= Allergic to Medication; AU= Analgesic use; AV= Analysis of variance; BFKP= Beliefs, Fear, and Knowledge of Pain; BK= Better Knowledge; BPI=Brief Pain Inventory; BQ= Barrier Questionnaires; BR= Block Randomization; CC=Chief Complain; CF=Conceptual Framework; CGI= Computer-Generated Instructions; CI= Confidence Intervals; CKD=Chronic Kidney Disease or Nephropathy; CP=Chronic Pain; CPCT= Common, Potentially Confusing Terms; CR= Cluster randomization; CREB= Clinical Research Ethics Board; CS= Clinical Setting; CT=Compared to; CTR=Carpel Tunnel Release Surgery; DC=Discharged; DI=Discharge Instructions; DIP= Difference In Proportions; DMLAE=Dual-Modality (Written and Spoken) Literacy-Appropriate Educational Strategy; DO= Disposal of Opioids; DP= Decreased Pain; DPPI= Descriptive Phrases for Pain Interference; DQ= Demographic Questions; DSOW=Disposal and Safe Opioid Weaning; DV=Dependent Variable; DVPRS= Defense and Veterans Pain Rating Scale; EBNC=Evidence-Based Nursing Committee; ED=Emergency Department; Ed=Education; EF= Educational Film; EI= educational intervention; EOLC= Elective, Outpatient Laparoscopic Cholecystectomy; R= Enrollment Rate; FKA=Fear, Knowledge, and Attitudes; FOSQ= Fear of Surgery Questionnaire; F/U=Follow Up; GA=Glenohumeral Arthritis; GISU=Gastrointestinal Surgical Unit; HA= Hydrocodone-Acetaminophen; HADS=the Hospital Anxiety and Depression Scale; HCP=Healthcare Provider; HERI=Hernia Repair Education Intervention; HSREB= Health Sciences Research Ethics Board; HVI= Hearing & visually impaired; ICV= Inability to Communicate Verbally; IF=Information; IHR=Inguinal Hernia Repair; IMEC= Institutional Medical Ethics Committee; IPP=Individualized Preoperative Pain; IMA= Intraoperative Multimodal Analgesia; IQR= Interquartile Range; IRCT= Irreparable Rotator Cuff Tears; IRB= Institutional Review Board; IS= Instructional Sheet; IT=Intervention; IV=Independent Variable; IU= inpatient unit; IWA= Improvement in Walking Ability; KDA= Knowledge on Drinking Alcohol; KN= Knowledge; LTOKR=long-term opioid knowledge retention; LHSC= London Health Sciences Centre; LOE=Level of Evidence; LOS=length of stay; LOM= List of Medications; LREC= Local Research Ethics Committee; M=Month; MBPIS= Modified Brief Pain Inventory survey; NC=No Counseling; N/C=Narcotic consumption; NDE= Nurse-Delivered Education; NE=North East; NP= Nurse Practitioner; NPM= Non-pharmacological Measures; NRS=Numeric Rating Scale; NSO= Not Sharing Opioids; NTSAC=Nursing Topic Submission Approval Committee; O=Opioid; O&A= Overdose and Addiction; OC= Opioid Consumption; OEP= Opioid Education Pamphlet; OHR= Open Hernia Repair; OISS= Opioid Information Satisfaction Scores; OME=Opioid in Morphine Equivalent; OP=Opioid Pills; OPC= Outpatient Clinic; OQPPM= Overall Quality of Postoperative Pain Management; OR=Odds Ratio; OS= Overall Satisfaction; ORS= Opioid Reduction Strategies; OTISS= Opioid Tapering Information Satisfaction Scores; OU=Opioid Use; PCA=Patient Controlled Analgesia; PDSA= Plan-Do-Study-Act; PEOPR= Patients' Experience of Pain Relief; PF= Patient Function; PI=Preoperative Interview; PF= Patient Function; PMA= Postoperative Multimodal Analgesia; PRAP= Patient-Reported Average Pain; PRAAU= Patient Reported Anti-Inflammatory & Acetaminophen Use; PSI= Psychologically Impaired; PIL= patient information leaflet; PNE=Preoperative Narcotic Education; POI= Pre-operative Interview; POMS=Profile of Mood State; POC=Preoperative Opioid Counseling; POD=Postoperative Day; POCF=Patient Opioid Counseling Form; POPIP= Perceptions of Preoperative Information About Pain; PPA= priori power analysis; PPE=Patients' Pain Experience; PR=Pain Relief; PRTI= Participants' Reaction to Intervention; PRIWA=Pain-Related Interference With Activities; PSH=Perioperative Surgical Home; PSS= Patient Satisfaction Surveys; PSWI= Patients' Satisfaction With The Information; Pts.=Patients; PU=Proper use; PUD=Peptic Ulcer Disease; PUSMO=Patients' understanding of the safe management of opioids; PWS=Performed with Sedation; Q=Questionnaire; QE=Quasi-Experimental; QI=Quality Improvement; QRC=QI Review Committee; RA=Research Assistance; RCT=Randomized Control Trial; REB= Research Ethics Board; RMAV=Repeated measures analysis of variance; RN=Registered Nurse; RofA= Risk for Addiction; ROA= Routes of Administration; ROC=Review of Chart; RPI- Routine Preoperative Information; R/R= Relative Risk; RR=Response Rate; R/T=Related to; Rx=Prescription or treatment; SAMHSA= Substance Abuse and Mental Health Service Administration; SC=Surgical Center; SD= Standard Deviation; SE= Side Effects; SJH= St Joseph's Hospital; SM= Standard Management; SMAR=Standard Multimodal Analgesic Regimen; SOC=Standard of Care; SOGSP=Selected Outpatient General Surgery Procedures; SOQ= Structured Open-ended Questions; SP&P PMP=Standardized Preoperative & Postoperative Pain Management Protocol; SS= Statistical Significance; S/S=Signs & Symptoms; SSO= Safe Storage of Opioids; SSP= Safe Storage of Pills; SSPIS= Simple, Structured Patient Information Sheet; STROBE=Strengthening the Reporting of Observation Studies in Epidemiology; TKA= Total Knee Arthroplasty; TN=Total Number; TV= Television; UAH= Urban Academic Hospital; UAMC= Urban Academic Medical Center; UC= Usual Care; UCF= unimpaired cognitive function; UMCU=University Medical Center Utrecht; UOA=Use of Antiemetics; UP= Unbearable Pain; URUD= unable to read or understand Dutch; US=United States; USE=Unable to speak English; UTC= Unable to Complete; UTRUE=unable to read & understand English; VAS= Visual analogue scale; VCHRI= Vancouver Coastal Hospital Research Institute; VDI=Video Discharge Instructions; VRS=Verbal Rating Scale; W=Weeks; WOO= While on Opioid; WTP=Willing to Participate; x=Times.

1=Alter, T. H., & Ilyas, A. M.; 2= Chakravarthy et al.; 3= Chumbley et al.; 4= McCarthy et al.; 5= Sawhney et al.; 6= Syed et al.; 7= Costello et al.; 8= van Dijk, et al.; 9= Hartford et al.; 10=Yajnik el al.; 11=Costello, M.; 12= Andersson et al.; 13= Waszak et al.; 14=Rose et al.

Interventions - Ed=Education; EF= Educational Film; F to F= Face to Face; HERI=Hernia Repair Education Intervention; HPE=Healthcare Provider Education; IT=Intervention; IMA= Intraoperative Multimodal Analgesia; KN=Knowledge; NT= Nurse Training; OE= Opioid Education; Ond. =Ondansetron; OU=Opioid Use; PEC= Patient Education Card; PI=Patient Interview; PIL= patient information leaflet; PMA= Postoperative Multimodal Analgesia; PNE=Preoperative Narcotic Education; POCF=Patient Opioid Counseling Form; PRAP=Patient Reported Average Pain; Pt.=Patient; QE=Quasi-Experimental; RCT; Randomized Control Trial; SOC=Standard of Care; SOU=Safe Opioid Use; SSPIS= Simple, Structured Patient Information Sheet; SLOEP=Simple Low-Cost Opioid Education Pamphlet; Tram=Tramadol; UC=Usual Care; VAS=Visual Analogue Scale; VDI=Video Discharge Instructions; VW= Verbal & Written

Outcomes - AD=Ambulation Distance; AE=Adverse Effects; AU=Analgesic Use; BK=Better Knowledge; BFPK= Beliefs, Fear, and Knowledge of Pain; Co=Codeine; KDA= Knowledge on Drinking Alcohol; LOS=Length of Stay; KN=Knowledge; KOD= Knowledge of Danger; MMPS=Maximum & Minimum Pain Score; NC=Narcotic Consumption; NPM=Non-Pharmacological measures; NRS=Numeric Rating Scale; OC=Opioid Consumption; OISS= Opioid Information Satisfaction Scores; OQPPM= Overall Quality of Postoperative Pain Management; OTISS= Opioid Tapering Information Satisfaction Scores; OU=Opioid Use; PEOPR= Patients' Experience of Pain Relief; PI= Pain Intensity; POPIP= Perceptions of Preoperative Information About Pain; PPS=Patient Pain Score; PRAP=Patient Reported Average Pain; PRIWA= Pain-Related Interference With Activities; PSWI= Patients' Satisfaction With The Information; PUSMO= Patients' understanding of the safe management of opioids; SE=Side Effects; TMC= Total Morphine Consumption; TOD=Total Opioid Dose; TOME= Total Oral Morphine Equivalents; TOU=Total Opioid Use; UOA= Use of Antiemetic

Appendix B: Synthesis of Research

Table B1

Level of Evidence, Interventions, & Outcome

Level of Evidence: 14 Studies

Studies	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Level I: Systematic review or meta-analysis														
Level II: Randomized controlled trial	X	X	X	X	X	X								
Level III: Controlled trial without randomization							X	X						
Level IV: Case-control or cohort study									X	X				
Level V: Systematic review of qualitative or descriptive studies														
Level VI: Qualitative or descriptive study (includes evidence implementation projects)											X	X	X	X
Level VII: Expert opinion or consensus														

Studies, Interventions & Outcomes

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Synthesis
IT	POC	VDI	PIL	MS	HREI	PNE	OED RN IS Pt.	OEd. Film	STOP N IT	Pt. Ed. Card	OEd.	VW Ed.	OED RN IS Pt.	OEP	
Form of information	VW	VW, Video	VW	VW	VW	VW, Video	VW	Video	VW, Protocols	VW	VW	VW	VW	W	**VW 9 of 14** **VW/Video 2 of 14** **W 1 of 14** **VW/Protocol 1 of 14** **Video 1 of 14**
Outcome 1 KN		KN	KN	KN			KN RN & Pt.	KN	KN		KN (PUSMO)	KN (POPIP)	KN RN & Pt.	KN	10 of 14
Outcome 2 OU	OC			OME	AU/AE	NC			OU	OME					6 of 14
Outcome 3 Intensity	PPE				Intensity			Intensity		Intensity					4 of 14
Outcome 4 Other		Feasibility	Confusion							AD, LOS, UOA				PSWI (OISS & OTISS)	4 of 14

Table B2

Description of Outcomes & Results

Description & Results

Study	LOE	SIZE	IT	Knowledge	Opioid use	Pain Score	Perception	Other
1	II	40	POC		ME Pills- POC 1.4 Vs NC 4.2, **p< .05**	Mean NRS no SSD		
2	II	52	VDI	VDI=82% SD=4.98, SOC=65% SD=4.53 **p= .001)**				Feasible = RR=96%
3	II	225	PIL/PI	Means of clusters RPI=2.45, PIL=2.88, P1=2.78, **p=0.02**	Not SSD, (p= 0.47)			↓confusion for PIL p = 0.03 No SSD in anxieties, pain, & SE
4	II	210	MS	MS MN-2 IQR-1-2; UC MN 1 IQR 0-2 p **<0.0001**			MS 38%, UC18.2% Reported BK	
5	II	82	HREI		MN OME HERI-9.2mg SD=11.2 UC-23.1 mg SD=26.5, **p=0.004**	Mean NRS 4.7 (±2.2) 7.2(±2.8) p = 0.0001)		Both groups used NPM HREI=↓ PRIWA (p=0.006) & walking ability (p=0.008).
6	II	140	PNE	More likely to D/C sooner in PNE (OR, 6.80; 95% CI, 1.57-29.43) **p = .008).**	19% (p=. 1), 33% **(p=. 02),** 42% **(p=. 01)** fewer N's than SP&P at the 2,6 W & 3M	VAS in IV1 & IV2 @ 2 W (p =. 008) & 6 W (p =. 001), @3M (p =. 99).		
7	III	93/100	OEd RN/ Pt. IS	SSO ↑36%, DO ↑28%, AOUOP↑48%, NSO ↑49%	↓ in OU increased by **46%**	↓ in Pain score increased by 46%		
8	III	377	Ed Film	Ed Film MN-1, IQR 0-2 Control MN-2 IQR 1–3, **p < .001** Ed film MN-5, IQR 4.5-5 Control MN-4 IQR 3-4.5. **p < .0001**		No change		
9	IV	536	STOP N IT	FKA-Clinically Improved.	MN OME (100; IQR 75-116) pre IT (50; IQR 50-50) post IT, **p < 0.001)**	No SSD, P=0.12	OQPPM improved 85% vs 69%, p < 0.001).	No. of surgeons Rx'ing > 50 OMEs was 100% pre IT & 31% post IT (p < 0.001)
10	IV	40	Pt. Ed Card		MN OME 38 (1–117) Vs 71 (32–285) **p=. 001** Difference (95%CI)1 of 67 (24–110)	No SSD		
11	VI	1	Preop OEd.	OEd improved PUSMO & safe weaning of opioids.				
12	VI	18	Pain Ed	Written and verbal information increased knowledge and participation in care.			Preop Ed improved pts. Perceptions of preop information	
13	VI	36/52	OEd RN/ Pt. IS	RN ME score ↑73 to 98%, **p= 0.000** Pt. KN 100% on how to take meds. 80.8% how to take, store, or dispose safely				
14	VI	226	OEP	DO↑5% to 27%, **p = 0.005**			↑OISS 6.2 (3.1) to 7.8 (2.8), p = 0.029). ↑OTISS i3.0 (3.9) to 7.6 (3.2), p < 0.001).	

Table B3

Description of Effect of Interventions on Outcomes & Studies with Major Findings

Effect of Interventions on Outcomes

Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Synthesis
Level of Evidence	II	II	II	II	II	II	III	III	IV	IV	VI	VI	VI	VI	
Size (N)	40	52	225	210	82	140	93/100	377	536	40	1	18	36/52	226	
Interventions	POC	VDI	PIL/ PI	MS	HERI	PNE	OEd. RN Pts. IS	Ed. Film	STOP N IT	Pt. Ed. Card	OEd	Preop Ed.	OEd. RN Pt. IS	OEP	
Form of information	VW	VW, Video	VW	VW	VW	VW, Video	VW	Video	VW, Protocols	VW	VW	VW	VW	W	
Outcomes	**Effects**														
Knowledge		↑	↑	↑		↑	↑	↑			↑	↑	↑	↑	10 OF 14
Perception				↑BK					↑OQPPM			↑POPIP		↑	4 of 14
Opioid Use	↓		—		↓	↓	↓		↓	↓Total OME					6 OF 14
Pain Score	—		—		↓	NA	↓	—	—						2 OF 13
Other			↓ Confusion		↓PRIWA				↓OME Rx	—					3 OF 14

Studies with Major Findings that Addresses PICOT

Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Synthesis
LOE	**II**	**II**	**II**	**II**	**II**	**II**	**III**	**III**	**IV**	**IV**	**VI**	**VI**	**VI**	**VI**	6 LOE=II 2 LOE=III 2 LOE=IV 4 LOE=VI
Size (N)	40	52	225	210	82	140	93/100	377	536	40	1	18	36/52	226	
Mean Age	61	41	59	44	61	59	-	55	50	67	36	71	-	62	
IT	POC	VDI	PIL	MS	HREI	PNE	OEd. RN Pts. IS	Ed. Film (Pain)	STOP N IT	Pt. Ed. Card	OEd.	Preop Ed.	OEd. RN Pt. IS	OEP	
Outcomes	**Effects**														
Knowledge	NM	↑	↑	↑	NM	↑	↑	↑	NM	NM	↑	↑	↑	↑	10 of 14
Opioid Use	↓	NM	—	NM	↓	↓	↓	NM	↓	↓	NM	NM	NM	NM	6 of 14
Pain Score	—	NM	—	NM	↓	NM	↓	—	—	NM	NM	NM	NM	NM	2 of 14

Appendix C: Models

Figure C1

Larrabee's Model for Evidence-based Practice Change

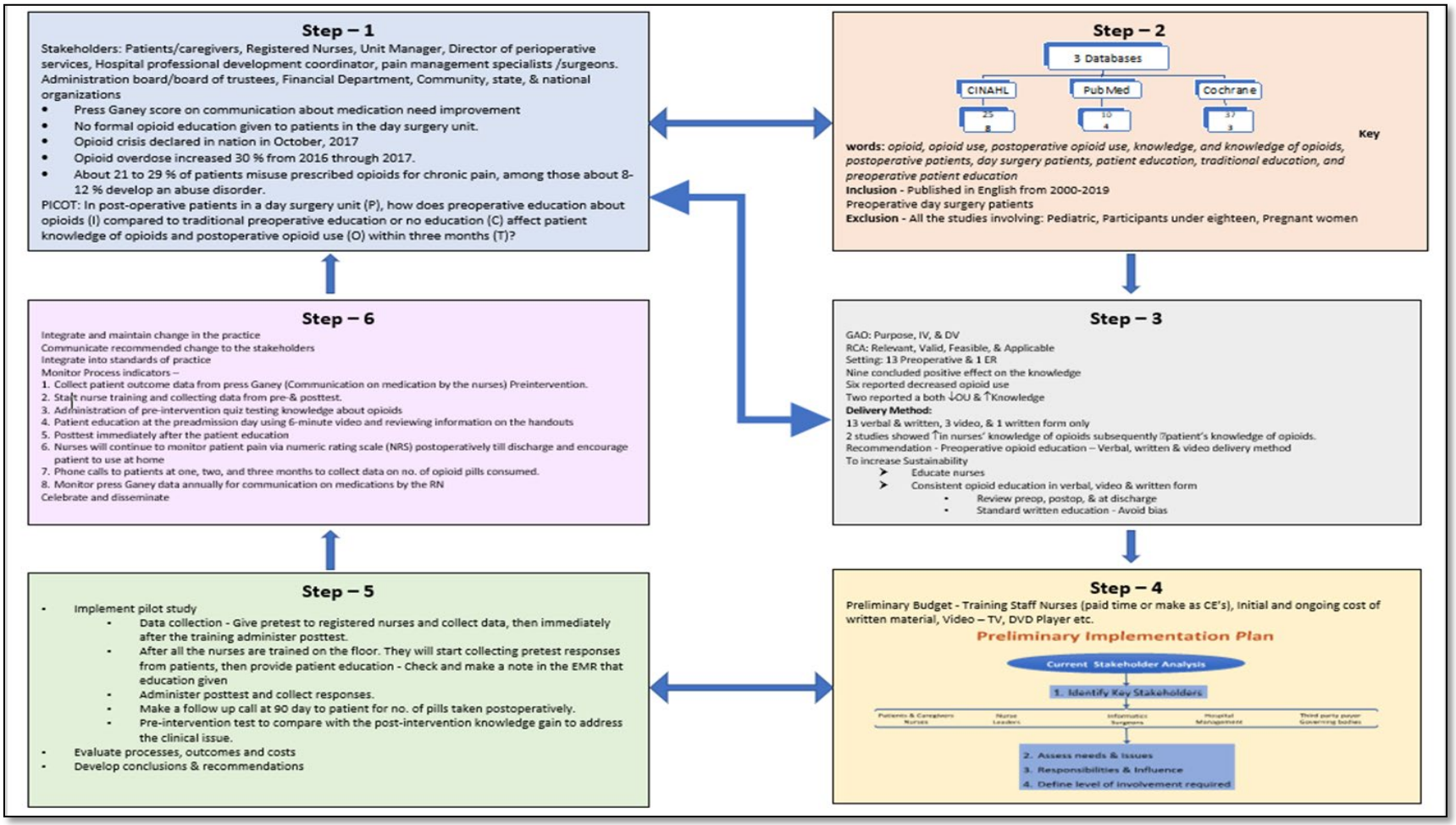
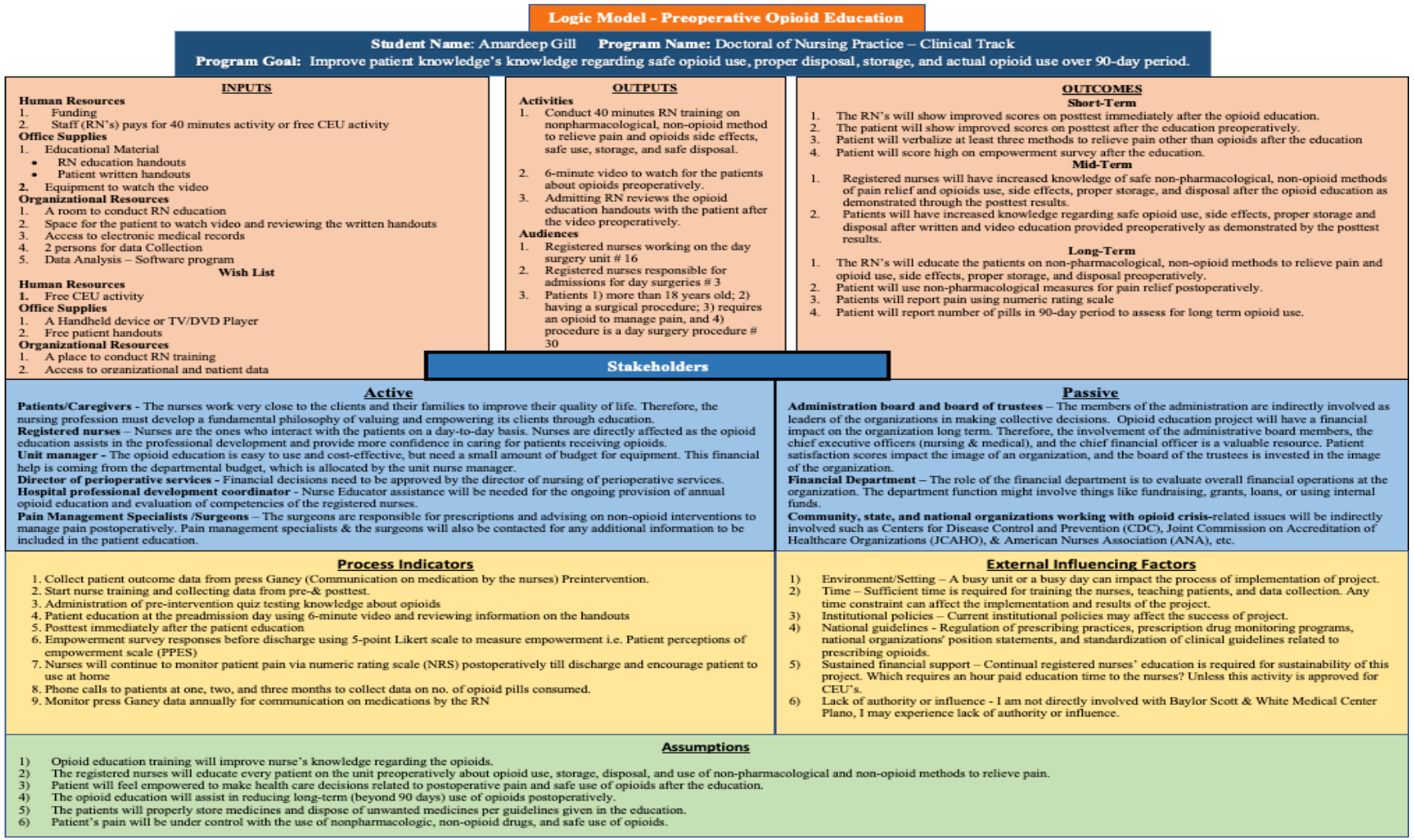
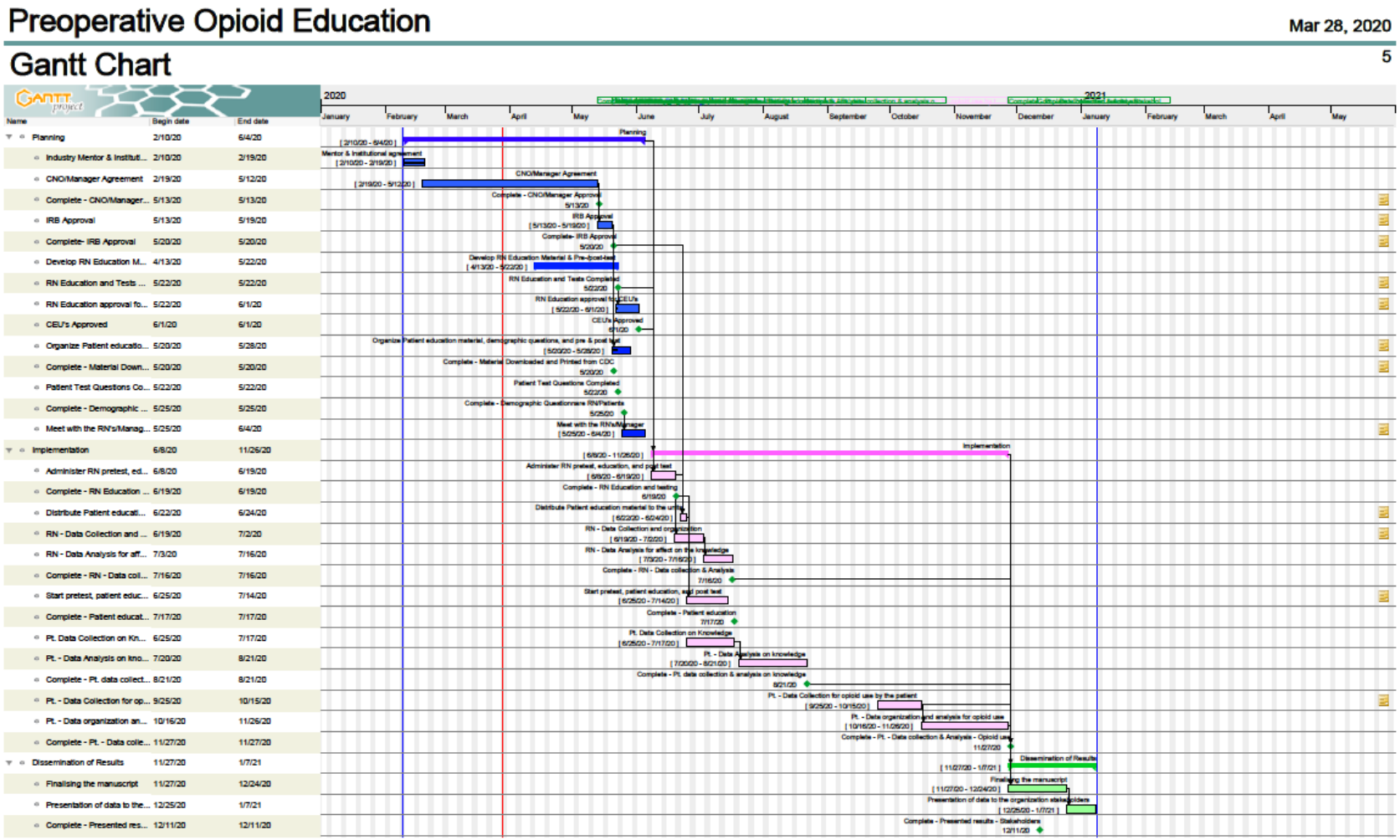


Figure C2

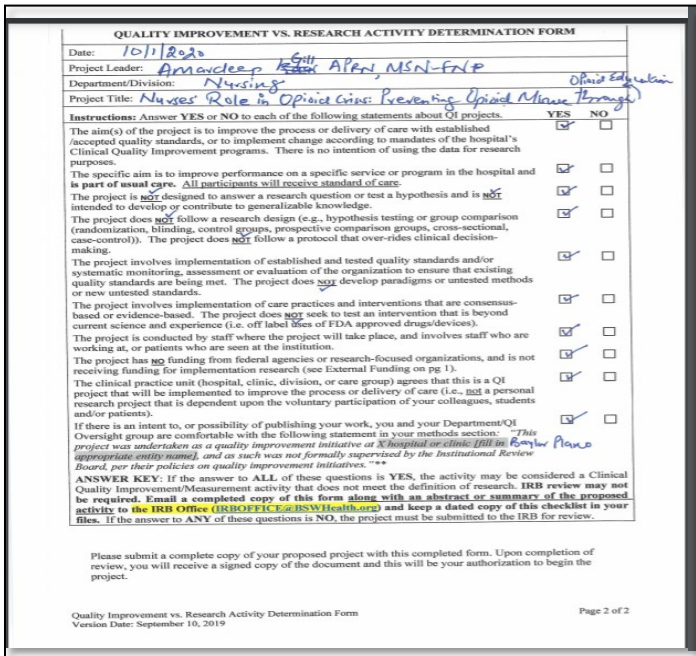
Logic Model for Opioid Education DNP Project



Appendix D: Description of Timeline for the Project using Gantt Chart



Appendix E: Organizational Letter of Approval & Ethic Review



QUALITY IMPROVEMENT VS. RESEARCH ACTIVITY DETERMINATION FORM

Date: 10/1/2020

Project Leader: Amardeep Gill APRN, MSN-FNP

Department/Division: Nursing

Project Title: Nurses' Role in Opioid Crisis: Preventing Opioid Misuse through Opioid Education

Instructions: Answer **YES** or **NO** to each of the following statements about QI projects.

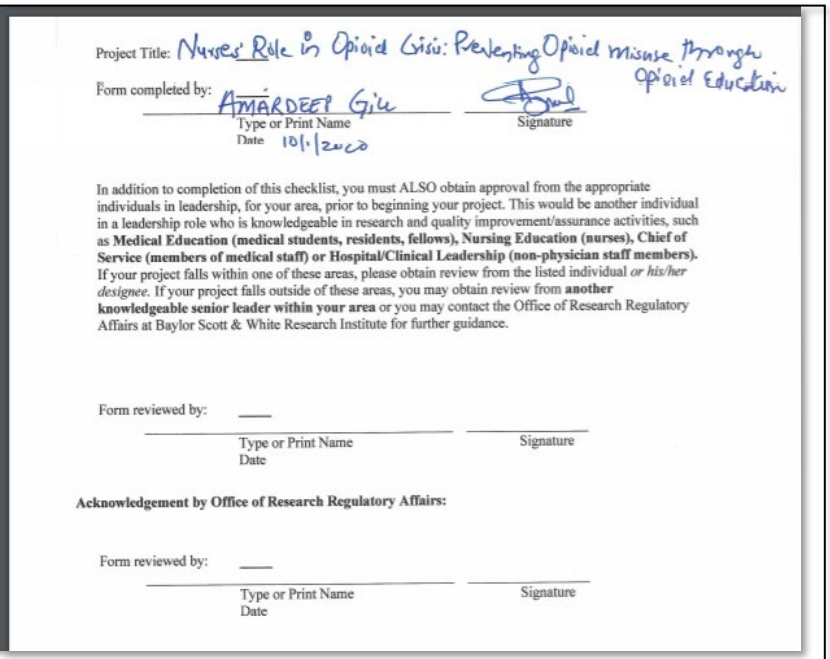
	YES	NO
The aim(s) of the project is to improve the process or delivery of care with established /accepted quality standards, or to implement change according to mandates of the hospital's Clinical Quality Improvement programs. There is no intention of using the data for research purposes.	☑	☐
The specific aim is to improve performance on a specific service or program in the hospital and **is part of usual care.** All participants will receive standard of care.	☑	☐
The project is NOT designed to answer a research question or test a hypothesis and is NOT intended to develop or contribute to generalizable knowledge.	☑	☐
The project does NOT follow a research design (e.g., hypothesis testing or group comparison (randomization, blinding, control groups, prospective comparison groups, cross-sectional, case-control)). The project does NOT follow a protocol that over-rides clinical decision-making.	☑	☐
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does NOT develop paradigms or untested methods or new untested standards.	☑	☐
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does NOT seek to test an intervention that is beyond current science and experience (i.e. off label uses of FDA approved drugs/devices).	☑	☐
The project is conducted by staff where the project will take place, and involves staff who are working at, or patients who are seen at the institution.	☑	☐
The project has NO funding from federal agencies or research-focused organizations, and is not receiving funding for implementation research (see External Funding on pg 1).	☑	☐
The clinical practice unit (hospital, clinic, division, or care group) agrees that this is a QI project that will be implemented to improve the process or delivery of care (i.e., not a personal research project that is dependent upon the voluntary participation of your colleagues, students and/or patients).	☑	☐
If there is an intent to, or possibility of publishing your work, you and your Department/QI Oversight group are comfortable with the following statement in your methods section: *"This project was undertaken as a quality improvement initiative at X hospital or clinic: [fill in Baylor Plano appropriate entity name], and as such was not formally supervised by the Institutional Review Board, per their policies on quality improvement initiatives."***	☑	☐

ANSWER KEY: If the answer to **ALL** of these questions is **YES**, the activity may be considered a Clinical Quality Improvement/Measurement activity that does not meet the definition of research. **IRB review may not be required. Email a completed copy of this form along with an abstract or summary of the proposed activity to the IRB Office (IRBOFFICE@BSWHealth.org) and keep a dated copy of this checklist in your files.** If the answer to **ANY** of these questions is **NO**, the project must be submitted to the IRB for review.

Please submit a complete copy of your proposed project with this completed form. Upon completion of review, you will receive a signed copy of the document and this will be your authorization to begin the project.

Quality Improvement vs. Research Activity Determination Form
Version Date: September 10, 2019

Page 2 of 2



Project Title: Nurses' Role in Opioid Crisis: Preventing Opioid Misuse through Opioid Education

Form completed by: AMARDEEP GILL

Type or Print Name

Signature

Date 10/1/2020

In addition to completion of this checklist, you must ALSO obtain approval from the appropriate individuals in leadership, for your area, prior to beginning your project. This would be another individual in a leadership role who is knowledgeable in research and quality improvement/assurance activities, such as **Medical Education (medical students, residents, fellows), Nursing Education (nurses), Chief of Service (members of medical staff) or Hospital/Clinical Leadership (non-physician staff members).** If your project falls within one of these areas, please obtain review from the listed individual *or his/her designee*. If your project falls outside of these areas, you may obtain review from **another knowledgeable senior leader within your area** or you may contact the Office of Research Regulatory Affairs at Baylor Scott & White Research Institute for further guidance.

Form reviewed by: ____

Type or Print Name

Signature

Date

Acknowledgement by Office of Research Regulatory Affairs:

Form reviewed by: ____

Type or Print Name

Signature

Date

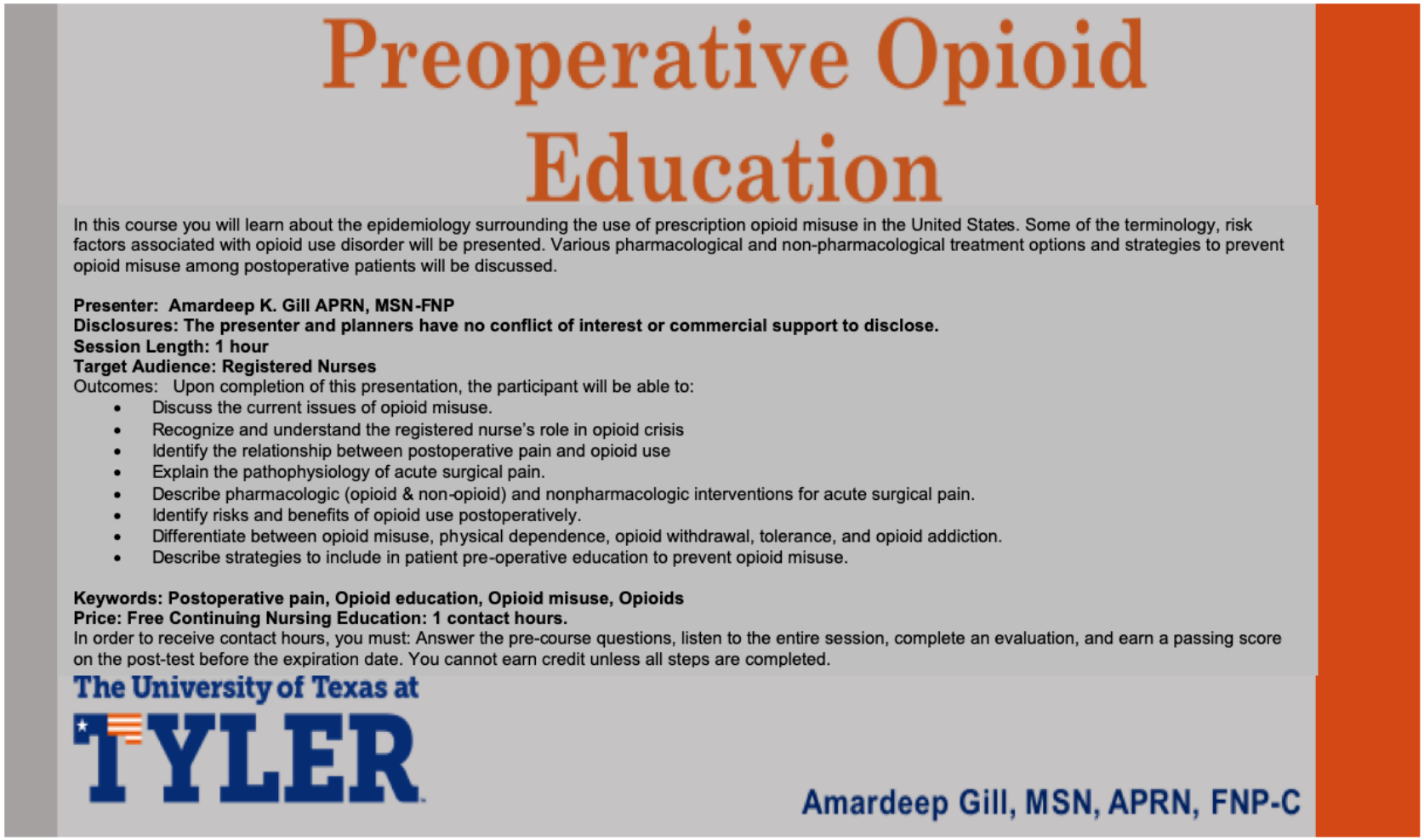
Good morning Amardeep,

Our office has reviewed your project and agree that this is QI and may proceed without IRB oversight.

Best,
Tracy

Tracy Troxell, CIP
IRB Program Manager
Research Regulatory Affairs

Appendix F: Project Implementation Forms/Protocol



Preoperative Opioid Education

In this course you will learn about the epidemiology surrounding the use of prescription opioid misuse in the United States. Some of the terminology, risk factors associated with opioid use disorder will be presented. Various pharmacological and non-pharmacological treatment options and strategies to prevent opioid misuse among postoperative patients will be discussed.

Presenter: Amardeep K. Gill APRN, MSN-FNP
Disclosures: The presenter and planners have no conflict of interest or commercial support to disclose.
Session Length: 1 hour
Target Audience: Registered Nurses
Outcomes: Upon completion of this presentation, the participant will be able to:

- Discuss the current issues of opioid misuse.
- Recognize and understand the registered nurse's role in opioid crisis
- Identify the relationship between postoperative pain and opioid use
- Explain the pathophysiology of acute surgical pain.
- Describe pharmacologic (opioid & non-opioid) and nonpharmacologic interventions for acute surgical pain.
- Identify risks and benefits of opioid use postoperatively.
- Differentiate between opioid misuse, physical dependence, opioid withdrawal, tolerance, and opioid addiction.
- Describe strategies to include in patient pre-operative education to prevent opioid misuse.

Keywords: Postoperative pain, Opioid education, Opioid misuse, Opioids
Price: Free Continuing Nursing Education: 1 contact hours.
In order to receive contact hours, you must: Answer the pre-course questions, listen to the entire session, complete an evaluation, and earn a passing score on the post-test before the expiration date. You cannot earn credit unless all steps are completed.

The University of Texas at TYLER

Amardeep Gill, MSN, APRN, FNP-C

Appendix G: Project Marketing

In this course you will learn about the epidemiology surrounding the use of prescription opioid misuse in the United States. Some of the terminology, risk factors associated with opioid use disorder will be presented. Various pharmacological and non-pharmacological treatment options and strategies to prevent opioid misuse among postoperative patients will be discussed.

Presenter: Amardeep K. Gill APRN, MSN-FNP

Session Length: 1 hour

Target Audience: Registered Nurses

Continuing Nursing Education: 1 Contact Hour

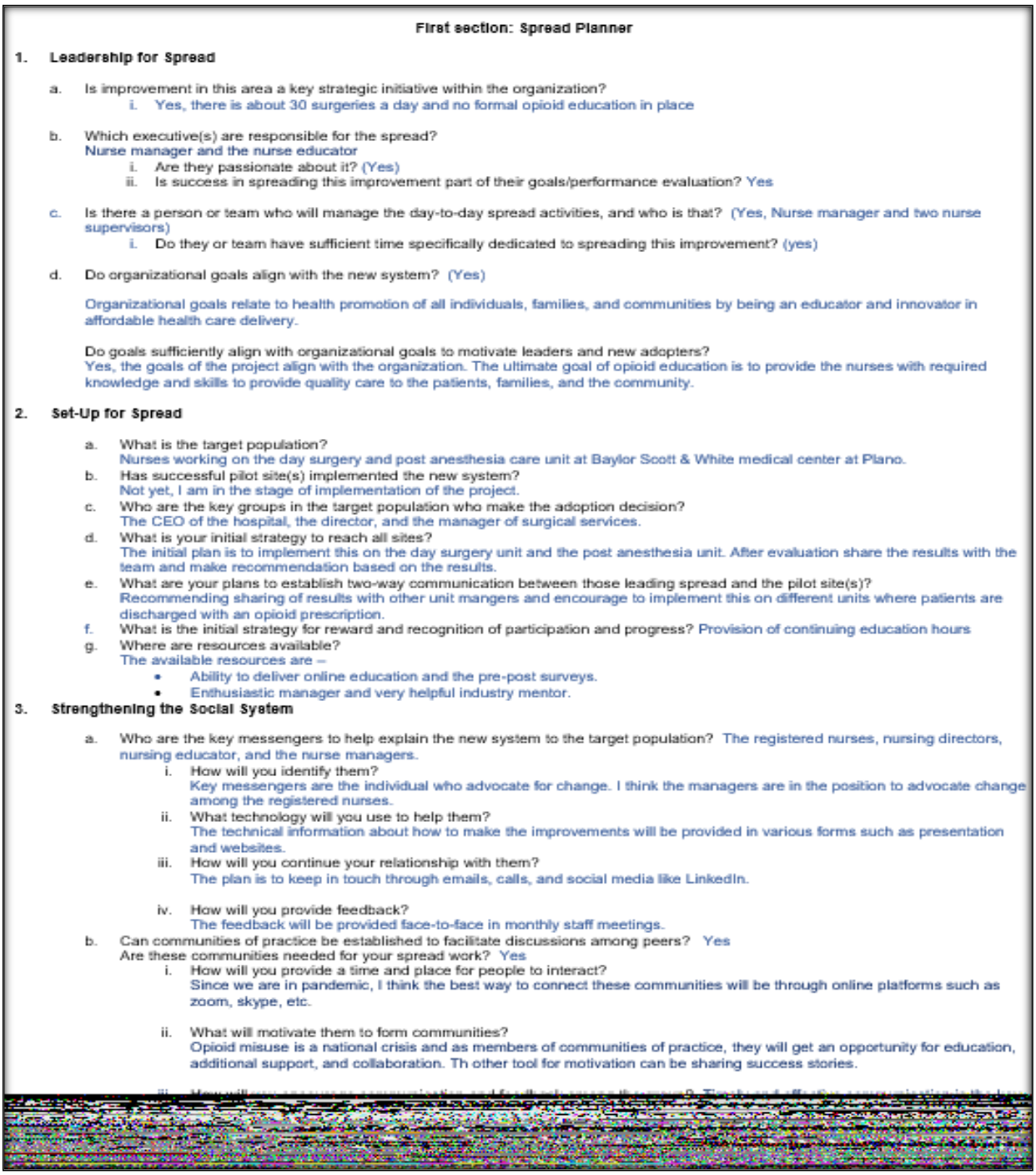
You must complete pre-test, online education, and post-test questions to receive contact hour!!

Link to pretest survey - https://uttyler.az1.qualtrics.com/jfe/form/SV_ehe9pGk5sjsfH3n

Appendix H: Sustainability Forms

Figure H1

Spread and Sustainability: Spread Planner Form



First section: Spread Planner

1. Leadership for Spread

a. Is improvement in this area a key strategic initiative within the organization?
   i. Yes, there is about 30 surgeries a day and no formal opioid education in place

b. Which executive(s) are responsible for the spread?
Nurse manager and the nurse educator
   i. Are they passionate about it? (Yes)
   ii. Is success in spreading this improvement part of their goals/performance evaluation? Yes

c. Is there a person or team who will manage the day-to-day spread activities, and who is that? (Yes, Nurse manager and two nurse supervisors)
   i. Do they or team have sufficient time specifically dedicated to spreading this improvement? (yes)

d. Do organizational goals align with the new system? (Yes)

Organizational goals relate to health promotion of all individuals, families, and communities by being an educator and innovator in affordable health care delivery.

Do goals sufficiently align with organizational goals to motivate leaders and new adopters?
Yes, the goals of the project align with the organization. The ultimate goal of opioid education is to provide the nurses with required knowledge and skills to provide quality care to the patients, families, and the community.

2. Set-Up for Spread

a. What is the target population?
Nurses working on the day surgery and post anesthesia care unit at Baylor Scott & White medical center at Plano.
b. Has successful pilot site(s) implemented the new system?
Not yet, I am in the stage of implementation of the project.
c. Who are the key groups in the target population who make the adoption decision?
The CEO of the hospital, the director, and the manager of surgical services.
d. What is your initial strategy to reach all sites?
The initial plan is to implement this on the day surgery unit and the post anesthesia unit. After evaluation share the results with the team and make recommendation based on the results.
e. What are your plans to establish two-way communication between those leading spread and the pilot site(s)?
Recommending sharing of results with other unit mangers and encourage to implement this on different units where patients are discharged with an opioid prescription.
f. What is the initial strategy for reward and recognition of participation and progress? Provision of continuing education hours
g. Where are resources available?
The available resources are –
   - Ability to deliver online education and the pre-post surveys.
   - Enthusiastic manager and very helpful industry mentor.

3. Strengthening the Social System

a. Who are the key messengers to help explain the new system to the target population? The registered nurses, nursing directors, nursing educator, and the nurse managers.
   i. How will you identify them?
   Key messengers are the individual who advocate for change. I think the managers are in the position to advocate change among the registered nurses.
   ii. What technology will you use to help them?
   The technical information about how to make the improvements will be provided in various forms such as presentation and websites.
   iii. How will you continue your relationship with them?
   The plan is to keep in touch through emails, calls, and social media like LinkedIn.

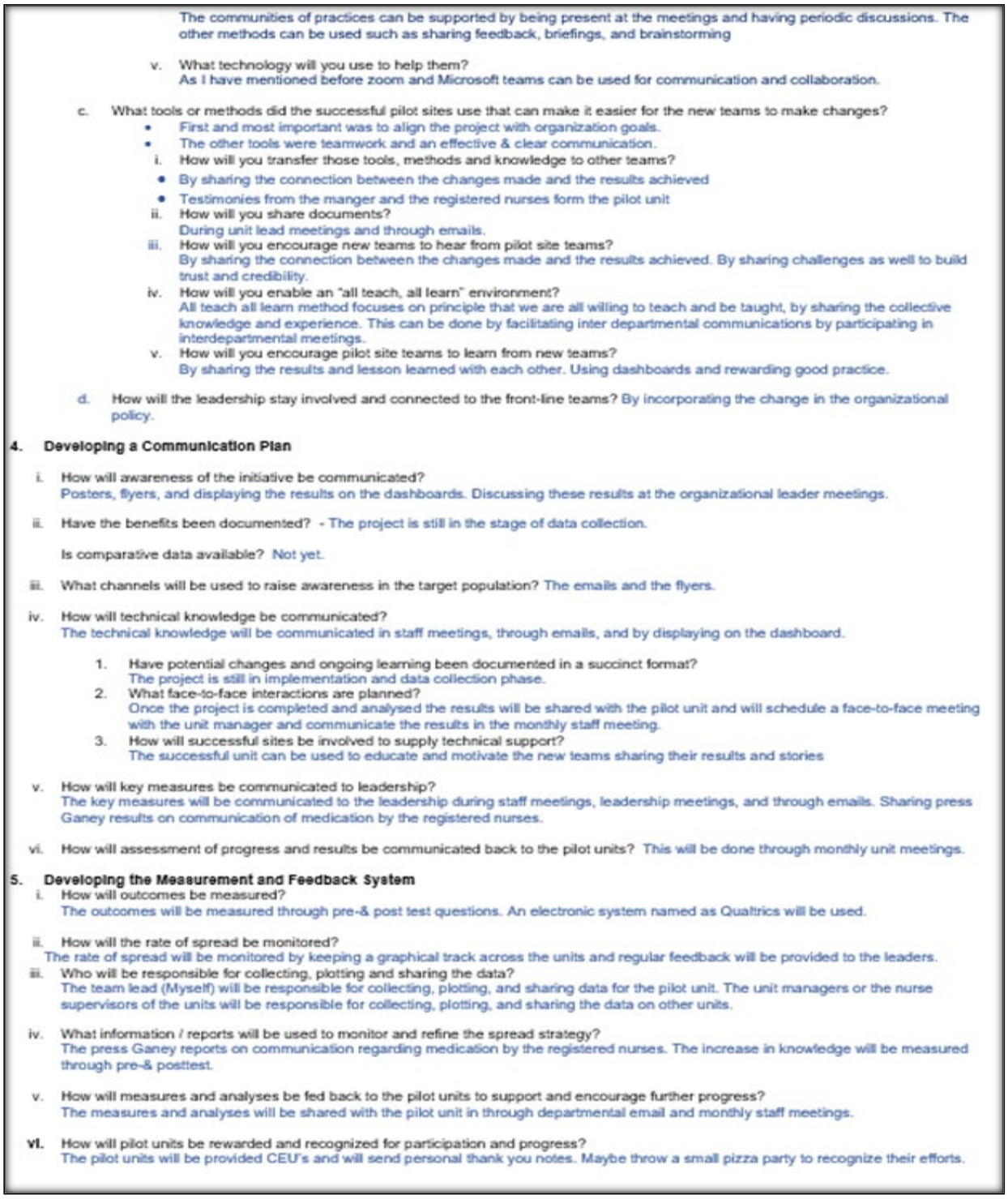
   iv. How will you provide feedback?
   The feedback will be provided face-to-face in monthly staff meetings.
b. Can communities of practice be established to facilitate discussions among peers? Yes
Are these communities needed for your spread work? Yes
   i. How will you provide a time and place for people to interact?
   Since we are in pandemic, I think the best way to connect these communities will be through online platforms such as zoom, skype, etc.

   ii. What will motivate them to form communities?
   Opioid misuse is a national crisis and as members of communities of practice, they will get an opportunity for education, additional support, and collaboration. Th other tool for motivation can be sharing success stories.

Appendix H: Continued

Figure H2

Spread and Sustainability: Spread Planner Form Continued



The communities of practices can be supported by being present at the meetings and having periodic discussions. The other methods can be used such as sharing feedback, briefings, and brainstorming

v. What technology will you use to help them?
As I have mentioned before zoom and Microsoft teams can be used for communication and collaboration.

c. What tools or methods did the successful pilot sites use that can make it easier for the new teams to make changes?
- First and most important was to align the project with organization goals.
- The other tools were teamwork and an effective & clear communication.

i. How will you transfer those tools, methods and knowledge to other teams?
- By sharing the connection between the changes made and the results achieved
- Testimonies from the manger and the registered nurses form the pilot unit

ii. How will you share documents?
During unit lead meetings and through emails.

iii. How will you encourage new teams to hear from pilot site teams?
By sharing the connection between the changes made and the results achieved. By sharing challenges as well to build trust and credibility.

iv. How will you enable an "all teach, all learn" environment?
All teach all learn method focuses on principle that we are all willing to teach and be taught, by sharing the collective knowledge and experience. This can be done by facilitating inter departmental communications by participating in interdepartmental meetings.

v. How will you encourage pilot site teams to learn from new teams?
By sharing the results and lesson learned with each other. Using dashboards and rewarding good practice.

d. How will the leadership stay involved and connected to the front-line teams? By incorporating the change in the organizational policy.

4. Developing a Communication Plan

i. How will awareness of the initiative be communicated?
Posters, flyers, and displaying the results on the dashboards. Discussing these results at the organizational leader meetings.

ii. Have the benefits been documented? - The project is still in the stage of data collection.

Is comparative data available? Not yet.

iii. What channels will be used to raise awareness in the target population? The emails and the flyers.

iv. How will technical knowledge be communicated?
The technical knowledge will be communicated in staff meetings, through emails, and by displaying on the dashboard.

1. Have potential changes and ongoing learning been documented in a succinct format?
The project is still in implementation and data collection phase.
2. What face-to-face interactions are planned?
Once the project is completed and analysed the results will be shared with the pilot unit and will schedule a face-to-face meeting with the unit manager and communicate the results in the monthly staff meeting.
3. How will successful sites be involved to supply technical support?
The successful unit can be used to educate and motivate the new teams sharing their results and stories

v. How will key measures be communicated to leadership?
The key measures will be communicated to the leadership during staff meetings, leadership meetings, and through emails. Sharing press Ganey results on communication of medication by the registered nurses.

vi. How will assessment of progress and results be communicated back to the pilot units? This will be done through monthly unit meetings.

5. Developing the Measurement and Feedback System

i. How will outcomes be measured?
The outcomes will be measured through pre-& post test questions. An electronic system named as Qualtrics will be used.

ii. How will the rate of spread be monitored?
The rate of spread will be monitored by keeping a graphical track across the units and regular feedback will be provided to the leaders.

iii. Who will be responsible for collecting, plotting and sharing the data?
The team lead (Myself) will be responsible for collecting, plotting, and sharing data for the pilot unit. The unit managers or the nurse supervisors of the units will be responsible for collecting, plotting, and sharing the data on other units.

iv. What information / reports will be used to monitor and refine the spread strategy?
The press Ganey reports on communication regarding medication by the registered nurses. The increase in knowledge will be measured through pre-& posttest.

v. How will measures and analyses be fed back to the pilot units to support and encourage further progress?
The measures and analyses will be shared with the pilot unit in through departmental email and monthly staff meetings.

vi. How will pilot units be rewarded and recognized for participation and progress?
The pilot units will be provided CEU's and will send personal thank you notes. Maybe throw a small pizza party to recognize their efforts.

Appendix H: Continued

Figure H3

Sustainability Section Two: Assessing Readiness for Spread Form

Steps	Score
STEP 1: Has the organization defined a goal for spread?	2
STEP 2: Has the organization selected a spread team?	2
STEP 3: Was the pilot team successful?	5
STEP 4: Is the planned change (spread goal) in the organization's strategic plan?	2
STEP 5: Are measures (spread action plan) in the organization's performance improvement plan / agreement?	2
STEP 6: Can staff maintain the data registry?	5
STEP 7: Is someone in leadership responsible for spread?	2
STEP 8: Are there potential major distractions affecting spread?	5
STEP 9: Does the executive director really believe in the proposed model, and the need to implement it within the health center system of care?	4
STEP 10: Did you answer 'yes' comfortably to all the questions above?	4

Third Section: Sustainability Scoring System

Score		
		Benefits beyond helping patients
8.7	8.7	The change improves efficiency and makes jobs easier
	4.7	The change improves efficiency but does not make jobs easier
	4.0	The change does not improve efficiency but does make jobs easier
	0.0	The change neither improves efficiency nor makes jobs easier
Score		**Credibility of the results**
9.1	9.1	Benefits of the change are immediately obvious, supported by evidence and believed by stakeholders
	6.3	Benefits of change not immediately obvious, even though supported by evidence and believed by stakeholders
	3.1	Benefits of change not immediately obvious, even though supported by evidence. Not believed by stakeholders
	0.0	Benefits of change neither immediately obvious, supported by evidence nor believed by stakeholders
Score		**Adaptability of improved process**
7.0	7.0	Process can be adapted to other organizational changes and there is a system for continually improving process
	3.4	Process can be adapted to other organizational changes but there is no system for continually improving process
	2.4	Process unable to adapt to other organizational changes, but there is a system for continually improving process
	0.0	Process unable to be adapted to other organizational changes, and no system for continually improving process
Score		**Effectiveness of system to monitor progress**
6.7	6.7	System in place to identify evidence of progress, monitor progress, act on it and communicate results
	3.3	System in place to identify evidence of progress and act on it, but results are not communicated
	2.4	System in place to identify evidence and monitor progress. Results communicated but no one acts on them
	0.0	No system in place to identify evidence of progress, monitor progress, nor act on or communicate it
31.5		PROCESS TOTAL SCORE
		STAFF
Score		**Staff involvement and training to sustain process**
11	11.0	Staff involved from beginning of the change and adequately trained to sustain the improved process
	4.9	Staff involved from beginning of the change but not adequately trained to sustain the improved process
	6.3	Staff not involved from beginning of the change but are adequately trained to sustain the improved process
	0.0	Staff neither involved from beginning of the change nor adequately trained to sustain the improved process
Score		**Staff attitudes towards sustain change**
11	11.0	Staff feel empowered as part of the change process and believe the improvement will be sustained
	5.1	Staff feel empowered as part of the change process but do not believe the improvement will be sustained
	5.1	Staff do not feel empowered as part of the change process but believe the improvement will be sustained
	0.0	Staff neither feel empowered as part of the change process nor believe the improvement will be sustained
Score		**Senior leadership engagement**
15	15.0	Organizational leaders take responsibility for efforts to sustain the change process, and staff generally share information with and actively seek advice from the leader
	6.2	Organizational leaders do not take responsibility for efforts to sustain the change process, but staff generally share information with and seek advice from leader
	5.7	Organizational leaders take responsibility for efforts to sustain the change process, but staff typically do not share information with or seek advice from the leader
	0.0	Organizational leaders do not take responsibility for efforts to sustain change process, and staff typically do not share information with and seek advice from the leader
Score		**Clinical leadership engagement**
15	15.0	Clinical leaders take responsibility for efforts to sustain change process, and staff generally share information with and actively seek advice from the leader
	6.7	Clinical leaders take responsibility for efforts to sustain change process, and staff generally share information with and actively seek advice from the leader
	5.5	Clinical leaders take responsibility for efforts to sustain the change process, but staff typically do not share information with or seek advice from the leader
	0.0	Clinical leaders do not take responsibility for efforts to sustain change process; staff typically do not share information with and seek advice from the leader
52		STAFF TOTAL SCORE
		ORGANIZATION
Score		**Fit with organization's strategic aims and culture**
7.2	7.2	A history of successful sustainability and improvement goals are consistent with organization's strategic aims
	3.3	A history of successful sustainability but improvement and organization's strategic aims are inconsistent
	3.5	No history of successful sustainability but improvement goals are consistent with organization's strategic aims
	0.0	No history of successful sustainability; improvement goals and organization's strategic aims are inconsistent
Score		**Infrastructure for sustainability**
9.7	9.7	Staff, facilities and equipment, job descriptions, policies, procedures and communication systems are appropriate for sustaining the improved process
	4.4	Appropriate level of staff, facilities and equipment but inadequate job descriptions, policies, procedures and communication systems for sustaining the improved process
	3.3	Appropriate level of staff, facilities and equipment but inadequate job descriptions, policies, procedures and communication systems for sustaining the improved process
	0.0	Staff, facilities and equipment, job descriptions, policies, procedures and communication systems are all not appropriate for sustaining the process
17.1		ORGANIZATION TOTAL SCORE

TOTAL SUSTAINABILITY SCORE

Process Score	31.5
+ Staff Score	52.0
+ Organization Score	17.1
Sustainability Total Score	100.6

Appendix H: Continued

Figure H4

Change Achievement Success Indicator Form

Local Change Management	
1.1 Formal change leadership	
Is responsibility / authority for making change assigned to one person, who reports to senior management? Do they have the time and the technical, people and political skills to plan and carry through the change and adapt to surrounding changes?	Y Y
Relative importance weighting	5
1.2 Formal change team	
Do the right mix of people make up a "change team"? Do they have sufficient time and skills to help carry through the change? Is it likely that over 60% of the team will remain in the team until change is completed?	Y Y Y
Relative importance weighting	5
1.3 Planning	
Is there a plan for the change, with flexibility to adjust to a changing situation? Does this have measurable objectives and a timetable of actions with responsibilities? Is there an agreed process for reviewing and replanning at regular intervals, including input and assistance from senior management?	Y Y Y
Relative importance weighting	5
1.4 Progress measurement, reviews, and reporting	
Have progress indicators been designed to give feedback about the change? Is this data regularly reported and used in reviews, adjusted to the changing situation? Are there regular meetings and ways to communicate with management and "key others" about the change?	Y Y Y
Relative importance weighting	4
1.5 Other resources	
• For change and change team, is there sufficient finance, access to expertise, training as needed, data support and other resources necessary?	Y
Relative importance weighting	5
The Nature of the Change	
2.1 Complexity	
Does the change require little new learning or skills? Does it involve people from similar occupational groups? Does it affect or concern few different "interest groups" or stakeholders? Is it a single, short change? Is success independent of sub-changes being completed and is there flexibility?	N Y N Y Y
Relative importance weighting	4
2.2 Compatibility, advantage, tested, and trialability	
Is change compatible with our values and operating procedures, and has a clear advantage over the current situation? Have similar changes been made elsewhere, and is this knowledge and evidence used to make the change? Has the change been tested in the organization on a small scale and lessons used to help the full change?	Y Y Y
Relative importance weighting	4
2.3 Cost benefit	
• Are there credible numbers showing the change will lower recurrent operating costs, and require few "investment" resources to carry through, relative to savings (including little extra personnel time), as calculated, and perceived?	Y
Relative importance weighting	3
Organizational Context	
3.1 Link between the change and the environment	
• Is there a process for "linking" the change to critical environmental pressures, or people responsible for planning and adjusting the change to relate to the environmental pressures?	Y
Relative importance weighting	5
3.2 Harnessing the other changes	
Has an assessment been made of other changes in the organization, and linked to the change to strengthen it? Is the change related to what "wants to happen in the organization" and emergent movements?	N Y
Relative importance weighting	4
3.3 Senior Management	
Do top management authorize the change and provide resources? Have they set measurable objectives and time targets for the change? Will one top manager formally supervise the change and receive reports of progress and problems?	Y Y Y
Relative importance weighting	5
3.4 Middle Management	
Are some middle managers required to support the change? Are these middle managers genuinely convinced that the change is needed and accountable for helping the change to be achieved? Will the change help them meet objectives and do they spend time and resources to remove obstacles? Is there a mechanism for keeping them regularly informed about the progress and consequences of the change?	Y Y Y Y
Relative importance weighting	5
3.5 Other leaders	
Is it known which other formal / informal leader's opinion is needed to progress change? Has action been taken to influence their opinion, and do they have a positive attitude to the change? Is there one or more respected professional who actively advocates for the change and is involved in the change (a "change champion")?	Y Y Y
Relative importance weighting	5
3.6 Rationale and tension for the change	
Are those affected by the change dissatisfied with the current situation and believe the change will improve things? Has evidence or good reasons been provided that the change will improve the situation of concern to them? Has a vision of intended future been presented and believed possible?	Y Y Y
Relative importance weighting	5
3.7 Change culture and attitudes	
Is the organization "change friendly"? Are changes like the one in question normally welcomed? Are personnel comfortable with change like this one?	Y Y Y
Relative importance weighting	5
3.8 Change saturation	
Personnel are not exhausted from and currently responding to many other changes The change does not add another burden to people's already over- stretched "change coping capability	N N
Relative importance weighting	5
External Context	
4.1 Customer Pressure	
• Are there pressures from customers for a change, and how much will or does the change respond to these?	Y
Relative importance weighting	5
4.2 Political Pressure	
• Is there pressure from local or national politicians for the change, and how much do they support it?	Y
Relative importance weighting	5
4.3 Economic Pressure	
• Does the change respond positively to current economic or market pressures on the organization?	Y
Relative importance weighting	5
4.4 Other external pressures	
• Is there other very strong pressure, to which the organization must respond if it is to survive? *Assess whether the change will help the organization respond to this pressure or not.*	1
Relative importance weighting	1
Total Score	89